
Net/One® PC System

Workstation Guide

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Writer/Illustrator: Robert Shepherd

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PREFACE

WELCOME!

This manual is designed to guide you in the use of Ungermann-Bass's Net/One PC System Workstation software, release 1.0. It has been written for the average office personal computer user, and addresses situations you will encounter in the day-to-day operation of your Net/One Workstation.

The manual assumes that you are reasonably familiar with the disk operating system, DOS (version 3.1 or higher). Net/One PC System is an extension to DOS, and uses most DOS commands, as well as a few of its own.

The "Related Publications" section at the end of this preface lists several useful documents covering DOS, should you wish to read more.

This Guide has been written to accommodate a wide range of users. Most of the material is methodical, with step-by-step instructions for working with Net/One PC System, plus background information to help you understand what's going on.

However, if you consider yourself a "power user", look over the first division of this manual, *Quick Install*. This division assumes that you are an experienced personal computer and Net/One PC System user. It contains a quick hardware installation checklist, a summary of the *Workstation User's Guide* division, and a command reference.

Regardless of whether or not you're a power user, most people get a sense of satisfaction from seeing a new software package or computer doing *something* quickly, without the bother of reading all the background detail. To accommodate you, the third division, the *Workstation User's Guide*, includes a "Quick Start" exercise in Chapter 2 which lets you make a network connection quickly and get a feel for Net/One PC System in action.

This guide assumes that:

- Your network hardware is fully operational.
- The network software is installed on your DOS disk.
- The network startup command has been included on your DOS disk.

If any of these tasks is incomplete, check with your network manager. It is the network manager's job to install the hardware and software needed to use the network. If your Net/One PC System software has not been installed, the *Net/One PC System Manager's Guide* explains how to do it.

Please take the time to fill out the manual evaluation form at the back of this manual when you have finished the installation of the software and have your network running. Our goal is to provide you with useful product documentation that answers your questions. We welcome your suggestions and look forward to working with you.

ORGANIZATION OF THIS GUIDE

This Guide is divided into four major divisions, separated by tabbed dividers:

Quick Install

This division is for "power-users" who need a terse reference to using Net/One PC System. It includes a quick checklist for hardware installation, a synopsis of the Workstation User's Guide, and a command summary.

Net/One PC Hardware Guide

This division provides detailed installation instructions for all Ungermann-Bass network interface adapters: the NIUpc, 3270 NIUpc, Personal NIU, and NIC. It also includes network connection instructions, troubleshooting information, and reference information on the network interface software.

Workstation User's Guide

This is the main body of this Guide, and deals with using the Net/One PC System Workstation software. It goes into more detail than the Quick Start division, and includes plenty of examples and background information.

Chapter 1, *Introduction*, provides an introduction to network concepts, Net/One PC System, and related terms.

Chapter 2, *Quick Start*, is a simple exercise to quickly show you Net/One PC System in action

Chapter 3, *Connecting to a Server*, covers the general method of connecting your workstation to a server, and the use of the **NET USE** command.

Chapter 4, *Using Remote Printers*, shows you how to connect to a printer at a server, and print files on it.

Chapter 5, *Using Remote Files*, shows you how to use files on a server, including programs and data files.

Chapter 6, *DOS Commands*, discusses DOS commands and programs which assist you in using the network.

Chapter 7, *Your Workstation's AUTOEXEC.BAT File*, describes how to use DOS's automatic startup file to customize your use of Net/One PC System.

Chapter 8, *Remote Server Commands*, describes a utility that lets you log on to a server remotely and give it commands.

Appendix A, *Command Reference*, is an alphabetized directory of Net/One PC System commands, with option information and examples.

Appendix B, *Messages*, lists the various messages which Net/One PC System might display, explains them, and suggests possible corrective action if required.

Connection Manager User's Guide

This division describes how to use Ungermann-Bass's pop-up window utility. The Connection Manager includes a simple terminal emulator, and allows you to redirect a workstation printer to a network printer.

CONVENTIONS USED IN THIS DOCUMENT

Commands and Keywords

A syntax definition is potentially made up of four elements (not necessarily in the order shown):

KEYWORD <variable> [option] {alternative}

KEYWORD

a predefined word which must always be spelled exactly. Keywords include system commands, command program names (i.e., executable files: .COM, .EXE, .BAT), ordinary files, and option switches. For example,

DIR TYPE ERASE

are all keywords used by the DOS operating system.

<variable>

A mnemonic, always appearing in angle brackets, which stands for some other text string you substitute when you actually use the command. A variable is always set off between angle brackets ("<" and ">").

{alternative}

Instructs you to choose one from a list of keywords; the list is always enclosed in curly brackets ("{" and "}"). An alternative list always completely defines the range of possible choices; unlike a variable, it is not "open-ended". Furthermore, you must choose only one item from the list.

[option]

Any part of a syntax definition which may be omitted when the command is used; it is always enclosed in square brackets ("[" and "]"). The contents of the option can consist of keywords, variables, and/or alternative lists; if they appear within square brackets you do not have to type them for the command to execute.

Dialog Examples

Dialogs between a user and the computer are shown with the user's portion underlined. For example:

```
NETID:(create LC File header with Network ID)
Enter serial number (1 to 7 digits): 135753Enter
Enter network ID (1 to 10 decimal digits): 19Enter
C>
```

Keys

Throughout this document you will be instructed to press certain keys on your keyboard. The legend on top of the key you are to press is surrounded by a box; some representative examples:

Enter

means press the "enter" key (labelled "newline" or "return" on some keyboards).

space

means press the space bar.

Some keys must be pressed in combination with others; these combinations are shown as two or three keytop symbols. For example:

Ctrl C

means press the control and "C" keys simultaneously.

Notes, Cautions, and Warnings

Often certain information in the text must be highlighted to give it special emphasis; this is information which is very important for you to notice and read. There are three classes of such special text:

NOTE A note is supplementary or background information. Sometimes it is just interesting; at other times it is a hint or reminder which will make using software or hardware easier.

CAUTION

A caution is more serious than a note. It presents information which is crucial to operation of a system. Failure to heed a caution may cause system failure (computer to crash, errors, incorrect operation of the software).

WARNING

A warning presents critical information: the danger of bodily harm to a human being, damage to equipment, or legal liability.

NOTICE

The Ungermann-Bass Net/One PC System product makes it possible to share single-user software over the network. This capability is not provided to enable you to circumvent the need for multiple-use licenses. You are responsible for ensuring that each user on the network is licensed for the software that is shared. This capability is provided to conserve hard disk resources by only requiring one copy of the software on the network and to facilitate resource-sharing.

Net/One[®] PC System

Quick Install

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Writer/Illustrator: Robert Shepherd

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1 HARDWARE INSTALLATION

INTRODUCTION

This chapter provides quick guidelines for installation Ungermann-Bass personal computer network interface adapters:

- NIUpc and 3270 NIUpc;
- NIUpc/Token Ring
- Personal NIU
- NIC

The model numbers of the various network adapters are shown in Tables 1-1 through 1-3.

REFERENCE

Division 2, Chapter 1

Table 1-1
Baseband Ethernet Network Adapters

<i>NIUpc Family:</i>	
NIUpc	PC2010
3270 NIUpc	PC2030
<i>Personal NIU Family:</i>	
Personal NIU/Ethernet	2261A
<i>NIC Family:</i>	
NIC Baseband (external transceiver)	2271A
NIC Baseband (internal transceiver)	2272A

Table 1-2
Broadband Ethernet Network Adapters

<i>NIUpc Family:</i>	
NIUpc	
(internal single-cable modem)	PC2011
(internal dual-cable modem)	PC2012
3270 NIUpc	
(internal single-cable modem)	PC2031
(internal dual-cable modem)	PC2032
<i>Personal NIU Family</i>	
Personal NIU/Ethernet Family	
(internal single cable modem)	2360A
(internal dual-cable modem)	2360B
(external single-cable modem)	2362A
(external dual-cable modem)	2362B
<i>NIC Family:</i>	
(internal single-cable modem)	2370A
(internal dual-cable modem)	2370B
(external single-cable modem)	2372A
(external dual-cable modem)	2372B

Table 1-3
Token Ring Network Adapters

<i>NIUpc Family:</i>	
NIUpc/Token Ring	PC2500

PREPARATION

Each adapter comes from the factory with certain default operating parameters set; refer to Table 1-4. If you are in doubt about the jumper settings, refer to Chapter 2 of the *Hardware Guide* (Division 2 of this manual). If you must change any of the settings, refer to that chapter for jumper settings, and Appendix A of the *Hardware Guide* for basic network software command line options.

REFERENCE

Division 2, Chapter 2 and Appendix A

Record the network address of each adapter. This can usually be located on the coverplate of the adapter, or is visible on a sticker on one of the board's PROMs.

REFERENCE

Division 2, Chapter 3

Table 1-4
Network Adapter Default Settings

Network Adapter	Memory	I/O	Interrupt
3270 NIUpc	D8000h	368h	2/3*
NIUpc	C8000h	368h	3
NIUpc/TR	D0000h	368h	2
Personal NIU	D0000h	360h	2
NIC	D0000h	n/a	2

* Interrupt 2 is used for IBM 3278/79 emulation functions. Standard network interrupt is 3.

INSTALLING THE NETWORK ADAPTER

All of the Ungermann-Bass network adapters are standard size personal computer plug-in cards; they install like any PC adapter. There are two considerations:

1. They generate a significant amount of heat. If possible, they should be installed in the outside slot nearest the case, to allow for conductive cooling through the case. This is especially true if you are installing an internal broadband modem.
2. If you are installing a card for use with an external broadband modem, you may have to allow for an empty slot next to the network adapter for the ribbon cable to the external modem. It is sometimes necessary to route this cable through an open adapter coverplate knockout.

BASEBAND ETHERNET INSTALLATION

Install the network adapter in the personal computer.

Connecting to an External Transceiver

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)

Attach a transceiver cable between the network adapter and the external transceiver 15-pin D-connectors. Tighten the hold-down screws on the connectors.

Connecting to Thin Ethernet

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)
Model 2272A	NIC (with internal transceiver)

The NIUpc, 3270 NIUpc, Personal NIU, and the NIC without an internal transceiver are connected to thin Ethernet through a thin Ethernet transceiver. Connect a transceiver cable between each of these adapters and the thin Ethernet transceiver. Connect the transceiver to the network through a BNC T-adapter. If this transceiver is the last one on the network, terminate it. One model of the NIC has an onboard thin Ethernet transceiver. Connect it directly to the network through a BNC T-adapter.

BROADBAND ETHERNET INSTALLATION

Broadband Ethernet uses RF modems and, basically, CATV cable plant. Ungermann-Bass provides both internal and external RF modems, which accommodate both single- and dual-cable configurations.

Installing an Adapter with an External Modem

Applies to:

Model 2362A	Personal NIU (ext. single-cable modem)
Model 2362B	Personal NIU (ext. dual-cable modem)
Model 2372A	NIC (ext. single-cable modem)
Model 2372B	NIC (ext. dual-cable modem)

Install the network adapter in the personal computer. Connect the modem ribbon cable to the 26-pin header near the top edge of the adapter, and route the cable out of the personal computer. Some models of PC have a small coverplate which can accommodate the connector on the ribbon cable; in other cases you'll have to route the ribbon cable through an unused adapter coverplate opening.

Connect the shielded ribbon cable to the adapter ribbon cable. Connect the other end of the shielded cable to the modem.

Installing an Adapter with Internal Modem

Applies to:

Model PC2011	NIUpc (int. single-cable modem)
Model PC2012	NIUpc (int. dual-cable modem)
Model PC2031	3270 NIUpc (int. single-cable modem)
Model PC2032	3270 NIUpc (int. dual-cable modem)
Model 2360A	Personal NIU (int. single-cable modem)
Model 2360B	Personal NIU (int. dual-cable modem)
Model 2370A	NIC (int. single-cable modem)
Model 2370B	NIC (int. dual-cable modem)

Install the network adapter and internal modem in the personal computer. If possible, install the modem in the slot nearest the cover, to improve heat conduction.

Connect the two cards with the supplied ribbon cable. Make sure that the ribbon cable lies flat along any intervening boards to avoid snagging or nicking the cable with the cover.

Connecting the RF Modem to the Network

Applies to:

Model PC2011	NIUpc (int. single-cable modem)
Model PC2031	3270 NIUpc (int. single-cable modem)
Model 2360A	Personal NIU (int. single-cable modem)
Model 2362A	Personal NIU (ext. single-cable modem)
Model 2370A	NIC (int. single-cable modem)
Model 2372A	NIC (ext. single-cable modem)

Single-cable systems: Attach one end of a drop cable to the multitap or wall outlet connector marked "SINGLE" or "FORWARD". Firmly hand-tighten the connector. Connect the other end of the drop cable to the lower F-connector on the modem. Make sure the upper connector has a 75-ohm terminator installed.

Dual-cable systems: Connect a drop cable between the lower F-connector on the modem and the multitap or wall outlet "FORWARD" connector. Connect another drop cable between the upper modem F-connector and the "REVERSE" multitap or wall outlet connector. Firmly hand-tighten all connectors.

REFERENCE

Division 2, Chapter 5

TOKEN RING INSTALLATION

Install the NIUpc/Token Ring (Model 2500) in the personal computer. Install a token ring cable between the 9-pin D-connectors on the network adapter and the DWC (Distributed Wiring Concentrator). Gently tighten the hold-down screws.

REFERENCE

Division 2, Chapter 6

INTRODUCTION

This chapter is a condensation of Division 3 of this manual, the *Workstation User's Guide*. It provides a condensed guide to Net/One PC System, for experienced "power users"; and it provides a reference for the power users we hope you become after reading the *Workstation User's Guide*.

The Power User's Guide has the same organization as Division 3, except that it omits Chapters 1, 2, and 7, and the Appendixes; the omitted chapters provide tutorial information, or purely reference information. We have further deleted background or tutorial information from the remaining chapters; what's left behind is tables, command descriptions, and procedures--the "meat" of the *Workstation User's Guide*.

In case we've cut too much, each of the following sections includes a cross-reference listing to Division 3. This will enable you to turn directly to a relevant page in the *Workstation User's Guide* for a detailed explanation or for background information.

You should use this chapter in conjunction with Chapter 3, the *Command Cheat Sheet*.

HELP

You can display information about using network commands by using the on-line help feature. See Table 2-1.

Table 2-1
Online HELP Commands

For Information About..	Type:
NET CONTINUE	NET CONTINUE HELP NET CONT HELP NET HELP CONTINUE NET HELP CONT
NET NAME	NET NAME HELP NET HELP NAME
NET PAUSE	NET PAUSE HELP NET HELP PAUSE
NET PRINT	NET PRINT HELP NET HELP PRINT
NET START	NET START HELP NET HELP START
NET USE	NET USE HELP NET HELP USE
NET VER	NET VER HELP NET HELP PRINT
(command summary)	NET HELP

CONNECTING TO A SERVER

The **NET USE** command connects your computer to a network resource, and gives the network resource a name that DOS can work with: a disk drive letter like **W:** or **G:** ; or the name of a printer, **LPT1:**, **LPT2:**, or **PRN:**. After **NET USE** has set up this connection, DOS and application programs can use the resource just as if it was a local drive or printer, by referring to the resource by its local device name.

There are three ways to use the **NET USE** command, as shown in Table 2-2.

Important points about NET USE

- The <device>: name (drive letter or printer device) must **always** be followed by a semicolon (";"). If you leave it out you will get an error message.
- Each space in the command is significant; if you leave one out you will get an error message.
- The name of the server must **always** be preceded by two backslashes ("\\").
- The <device>: name used when connecting to a remote directory should be the name of an unused drive on your computer. For example, if your workstation has a one hard disk drive it will be named drive **C:**; therefore, you can use any drive letter from **D:** through **Z:** for <device>.

You aren't forbidden from using the name of a drive which already exists on your computer; but if you do, the existing drive will be made unavailable, and the newly connected remote directory will take its place.

- Your network manager must provide you with a list of names of available servers. You can't connect to a server unless you know its name.

Table 2-2
NET USE Command
(General Forms)

SYNTAX

To list existing connections:

NET USE

To connect to a server resource:

NET USE <device>: \\<server>\<alias> []

To disconnect from a server resource:

NET USE <device>: /D

COMMAND LINE ARGUMENTS

<device>: The name of an unused device on your computer:
drive letters **A:** through **Z:**.
printer device names **PRN:**, **LPT1:**, **LPT2:**.
Note that both drive and printer names have a colon (":") after them.

\\<server> The network name of the server you want to connect with. Note that server names always begin with two backslashes ("\\").

<alias> The alias of the directory or printer.

[password] Your network manager will give you this password if it applies. (optional)

/D A switch used when you want to disconnect from a directory or printer. Explained later in this chapter. (optional)

- The <device>: name used when connecting to a remote printer should also be the name of an unused printer device on your computer. However, since most application programs default to LPT1:, you should probably use it as your remote printer.
- Your network manager will also provide you with a list of the aliases for each server. You can also find out for yourself what resources a server offers (as long as you know the name of the server) with a remote status display, as described in "Remote Server Commands".

REFERENCEDivision 3, pages 3-2 through 3-5

NET USE Messages

- When **NET USE** succeeds in establishing a connection it will display the message:

command completed successfully
- If you accidentally specify a <device> which has already been connected to the network, **NET USE** will display the message:

Drive in use

Note that this message refers to both printers and disk drives.
- If you leave out a required password, or misspell a password or alias, **NET USE** will display the message:

Invalid shortname or password

REFERENCEDivision 3, page 3-4

LISTING REMOTE CONNECTIONS

You can get a display of the existing connections between your workstation and servers by typing the **NET USE** command on a line by itself. Type:

NET USE

REFERENCE

Division 3, page 3-6

DISCONNECTING FROM THE SERVER

You can disconnect from a network resource either temporarily, or permanently. When you disconnect permanently, the connection is gone until you issue another **NET USE** command to reestablish it. When you disconnect temporarily, the network connection is suspended, and you can use a local resource by the same name until you resume the network connection.

Disconnecting Permanently

To disconnect a drive or printer <device> from a server use the **NET USE** command with the **/D** switch:

NET USE <device> **/D**

You cannot disconnect from a drive while you are using it. If you try to do so, you will see the message:

Cannot disconnect from current drive

Switch to another drive, then use the disconnect command again.

REFERENCE

Division 3, page 3-8

Disconnecting Temporarily

The **NET PAUSE** and **NET CONTINUE** commands suspend and resume redirection of local devices to the network. The commands work by suspending and resume either all disk drive redirection, or all printer redirection; they cannot specify individual devices.

The formal definition of **NET PAUSE** is shown in Table 2-3; the formal definition of the **NET CONTINUE** command is shown in Table 2-4. There are two alternatives with each command, disk or print redirection. Each alternative has two forms: spelled out, and a short four letter abbreviation.

Table 2-3 NET PAUSE Command	
SYNTAX	
NET PAUSE	{DISK REDIRECTION} {DRDR} {PRINT REDIRECTION} <input type="button" value="Enter"/> {PRDR}
COMMAND LINE ARGUMENTS	
DISK REDIRECTION	
DRDR	Suspends redirection of local disk drives to network directories.
PRINT REDIRECTION	
PRDR	Suspends redirection of local printer devices to network printers.

Table 2-3
NET CONTINUE Command

SYNTAX

NET CONTINUE {PRINT REDIRECTION}
 {PRDR}
 {DISK REDIRECTION}
 {DRDR}

COMMAND LINE ARGUMENTS**DISK REDIRECTION**

DRDR Resumes redirection of local disk drives to network directories.

PRINT REDIRECTION

PRDR Resumes redirection of local printer devices to network printers.

REFERENCE

Division 3, pages 3-8 through 3-10

USING REMOTE PRINTERS

CONNECTING TO A PRINTER WITH NET USE

The **NET USE** command that connects a local device to a server printer has the form shown in Table 2-5. Note that **LPT1:** and **PRN:** refer to the same device. You can redirect one or the other, but not both simultaneously.

REFERENCE

Division 3, pages 4-3, 4-4

DISCONNECTING FROM A SERVER PRINTER

You can break the connection between a workstation device and a server printer with the **/D** switch of the **NET USE** command:

NET USE <device> /D^{Enter}

REFERENCE

Division 3, page 4-3

Table 2-5
NET USE Command
(Connecting to a Printer)

SYNTAX

NET USE <device>:[space] \\<server>\<alias> [[space]<password>][Enter]

COMMAND LINE ARGUMENTS

<device>	The name of a local workstation print device: LPT1: or PRN: LPT2:, LPT3:
<server>	The name of the server to which you're connecting.
<alias>	The name of the printer assigned by the network manager. The network manager will give you a list of aliases, or you can display a list of server printers yourself as described later.
[<password>]	Some printers can't be used unless you supply a password. The network manager will provide the password to use these printers.

PRINTING FILES FROM DOS

The Net/One PC System command which prints a file on a remote printer is **NET PRINT**. The formal definition of **NET PRINT** is shown in Table 2-6.

REFERENCEDivision 3, page 4-5

Table 2-6
NET PRINT Command

SYNTAX**NET PRINT** <filename> space <device> Enter**COMMAND LINE ARGUMENTS**

<filename> The name of the file you want to print, including a pathname if applicable.

<device> The name of the device on your computer that you connected to the remote printer.

PRINTING FROM AN APPLICATION

Once you've established a connection from a local print device to a server printer, any application program can send data to the server printer through that print device.

REFERENCEDivision 3, page 4-6

PRINTER STATUS DISPLAYS

Displaying Print Queue Status from a Specific Server

To display the status of a server's print queue, type:

NET PRINT \\<server>

<server> is the name of the server; note the double backslashes ("\\") in front of the name. You can specify the name of **any** server which is on line. If **NET PRINT** can't find the server, you will see the error message:

Network path not found

If a print queue is empty, you will see the message:

Queue is empty

REFERENCE	Division 3, page 4-7
-----------	----------------------

Displaying Status of a Specific Printer

To display the status of the print queue for a particular print device, type:

NET PRINT <device>

<device> is the name of the print device: **LPT1:** through **LPT3:**, or **PRN:**. If you specify a printer that has not been redirected with **NET USE**, you will see the message:

Device is not redirected.

If a print queue is empty, you will see the message:

Queue is empty

REFERENCE	Division 3, page 4-8
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Print Queue Display

If the **NET PRINT** command is successful, it will display a screen something like this:

Pos	ID	Size	Date	Time	workstation sending file	current status of file
					Name	Status
001	240	22580	10/21/86	16:41	MARMADUKE	PRINTING
002	242	372	10/21/86	16:41	GARFIELD	
003	245	12923	10/21/86	16:42	ODIE	

↑ order files will be printed (001 first)
 ↑ queue file name (e.g. "PQ245")
 ↑ file size in bytes
 ↑ date into queue
 ↑ time into queue

REFERENCE

Division 3, pages 4-8, 4-9

THE **[PrtSc]** KEY

DOS has two special key combinations which echo screen output to the printer: **[Shift][PrtSc]**, which copies the current display to the printer; and **[Ctrl][PrtSc]**, which echoes every character typed subsequently at the keyboard to the printer. Both these functions send their output to **LPT1:**; if **LPT1:** has been redirected to a server printer, these functions will not work.

REFERENCE

Division 3, page 4-10

USING REMOTE FILES

THE NET USE COMMAND

NET USE connects your workstation to a server directory by associating a disk drive letter on your workstation with the alias of the server's directory. The definition of this form of **NET USE** is shown in Table 2-7.

REFERENCE

Division 3, pages 5-4 through 5-7

Table 2-7
NET USE Command
(Connecting to a Server Directory)

SYNTAX

NET USE <drive>:[space] \\<server>\<alias>[space] [<password>][Enter]

COMMAND LINE ARGUMENTS

<drive>:	The name of an unused drive on your computer; this is a drive letter, A: through Z:, which is not already used. Note the colon (":") after the drive letter.
\\<server>	The network name of the server you want to connect with.
<alias>	The alias of the directory.
[<password>]	Access to some directories may be restricted to those who know the password. Your network manager will have to give you this password if it applies. (optional)

PROTECTED DIRECTORIES

Your network manager may elect to restrict access to directories through two mechanisms: passwords, and restrictions on the types of operations that can be performed on the files in a directory. The latter means that the ability to read, write, or create a file can be limited.

Passwords

If the network manager has specified a password for a directory, you must include the password on the **NET USE** command line. Your network manager will provide a list of passwords you are authorized to use for restricted directories.

If you do not enter a password when one is required, or misspell the password, you will see the following message:

Invalid shortname or password

REFERENCE	Division 3, page 5-8
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Directory Access Restrictions

Net/One PC System allows your network manager to restrict the kinds of operations you can perform on the files in a directory. The restriction is placed on a directory as a whole, and applies to any files already in the directory, and files that may be added later. The network manager can individually grant workstations permission to:

Read: files in the directory can be read; they can be read in by applications, and copied and displayed from the DOS prompt.

Write: files in the directory can be written into (or written over).

Create: new files can be created, and existing files can be deleted.

These permissions can be granted in combination:

<u>R</u>	<u>W</u>	<u>C</u>	<u>Access allowed:</u>
■	■	■	Unlimited access to files.
■	■	.	Files may be read, and new data may be written into them (also, a file may be completely replaced by new data). File names cannot be deleted from the directory, and new file names cannot be created.
■	.	.	files may be read, but new data cannot be written into them, and they cannot be deleted. New files may not be added to a "read-only" directory.

REFERENCEDivision 3, page 5-9

SHARED FILES

Occasionally two workstations will attempt to access the same file on a server at the same time. When this happens one workstation will be successful (usually the first one to try), and the other will see the following message:

Error reading disk
Abort, Retry, Ignore?

Eventually the first workstation will be finished with the file. It's your option whether you keep trying by pressing **[I]**, or abort by pressing **[A]**.

REFERENCE	Division 3, page 5-10
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RUNNING APPLICATION PROGRAMS

Running Programs Stored on a Server

When you establish a connection between a local workstation drive and a directory on a server you can treat the files on the server's directory just as if they were on a local drive. This includes programs stored on a server directory; once you establish a connection with **NET USE**, you can run that program from the drive you connected just like any other drive.

REFERENCE	Division 3, page 5-11
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Running Workstation Programs with Server Data Files

You can use a data file stored on a server with most application programs that run under DOS. Any program which lets you specify the drive on which the data files are located can be used, simply by specifying the drive you linked to a server with **NET USE**.

However, there are some applications which read and write only to files that are in specific drives. These programs assume, for example, that your data files will always be in drive **B:**, or that they will always be in a particular directory.

You can solve the problem of an assumed drive by using the DOS **ASSIGN** command to "map" the drive connected to the server to the drive assumed by the program. The problem of an assumed directory can be solved with DOS's **APPEND** command, which tells DOS where to look for data files requested by an application if DOS can't find them in the current directory. Both commands are explained in Chapter 6.

REFERENCE

Division 3, page 5-11

DOS COMMANDS

RESTRICTED DOS COMMANDS

After you have used the **NET USE** command to connect to a network resource, you can use **almost** any DOS command with the remote files, directories, and printers. The exceptions are commands that read and write directly to the disk, as listed in Table 2-8. Note that you can still use these commands with your local disk drives.

(For the technically inclined: the commands you can't use all deal with the underlying structure of a disk; **FORMAT** is a good example. Redirecting a local disk drive to the network only simulates a disk drive, but the details of its real structure are hidden behind the Net/One PC System software. The equivalents for two of the commands--**COMP** for **DISKCOMP**, and **COPY** for **DISKCOPY**--work with individual files rather than entire disks).

If you try to use any of these commands with a remote file, directory, or disk you will see the message:

Cannot <command> a SUBSTed drive

where <command> is the name of the command you tried to use.

REFERENCE

Division 3, pages 6-2, 6-3

Table 2-8
Restricted DOS Commands

You cannot use...	Use instead...
CHKDSK	--
DISKCOMP	COMP
DISKCOPY	COPY
FDISK	--
FORMAT	--
JOIN	--
LABEL	--
PRINT	--
RECOVER	--
SUBST	--
SYS	--
VERIFY	--
-- indicates there is no equivalent command	

ACCESSING FILES IN OTHER DIRECTORIES: THE APPEND COMMAND

You may be familiar with the DOS **PATH** command that tells DOS to search the named directories for external command files. The **PATH** command works with files that have the **.EXE**, **.COM**, or **.BAT** filename extensions.

The **APPEND** command has a similar function, performed on data files (any file which isn't a runnable program). Use **APPEND** to access a file that is outside the current directory and that has an extension other than **.EXE**, **.COM**, or **.BAT**. Once you specify the pathname(s) with the **APPEND** command, you can use a file without moving to the directory where it is located. **APPEND** has three forms, as shown in Table 2-9.

Typing an **APPEND** command replaces the previous **APPEND**. Using **APPEND** adds about 2.5k bytes to the amount of memory in your computer used by DOS. If you are using the DOS **ASSIGN** command (as explained later in this chapter), you must type the **APPEND** command before the **ASSIGN** command. You will probably want to put **PATH**, **ASSIGN**, and **APPEND** commands in your **AUTOEXEC.BAT** file.

REFERENCE	Division 3, pages 6-4 through 6-6
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Table 2-9
The **APPEND** Command

SYNTAX 1

To define a search path for data files:

APPEND [<drive>:]<pathname>[:[<drive>:][<pathname>]][:...]

[<drive>:]<pathname>

The drive plus pathname of the directory containing the file you want to use. You can specify multiple search paths by separating each path with a semicolon (;); do not exceed 128 characters in the line.

SYNTAX 2

To display the list of appended directories:

APPEND

SYNTAX 3

*To cancel the previous **APPEND** command without specifying other directories to be searched:*

APPEND ;

THE ASSIGN COMMAND

DOS's **ASSIGN** command allows you "fool" an application program that insists on using a specific drive into using another drive. You simply assign the drive letter the application expects to the drive you want it to use. The **ASSIGN** command has the form:

ASSIGN <x>=<y>

where <x> is the drive required by the application, and <y> is the drive you are actually using.

REFERENCE	Division 3, page 6-7
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REMOTE SERVER COMMANDS

The **NET SERVER** command allows you to connect to a server and give it commands just as if you were typing on the server's own keyboard. It lets you display a summary of the server's status, list its available resources, and check the status of the server's printers and print queue.

LOGGING ON TO A SERVER

At the DOS prompt type:

NET SERVER <name> [<password>]

where <name> is the network name of the server, and [<password>] is the server password given to you by the network manager (you can omit the password, and be able to use a limited set of commands). You will see the following prompt:

Server:

You can now enter server commands. The commands you can use depend on whether or not you entered a password when you entered the **NET SERVER** command, as shown in Table 2-10. Without a password you can get only status displays. With a password you have access to all server commands except **PASSWORD** and **STOP**. Use either **EXIT** or **QUIT** to return to DOS.

Table 2-10
Remote Server Command Access

Command	w/o password	with password
EXIT	all	all
FILE	all	all
HELP	all	all
PRINT	status	all
QUIT	all	all
SEPARATOR	none	all
SHARE	status	all
STATUS	all	all

GETTING A LIST OF OFFERS FROM A SERVER

The server's **SHARE** command gives you this information. At the Server: prompt type:

Server: **SHARE /O**

Note the **/O** in the command. This command line switch turns off the display of the names of the users connected to each offer, and provides a more readable display. The server will display a screen something like this:

Access/ Status	Network Name	DOS Name	Names Using Device
RWC	PAYABLE	ACCTS\PAYABLE\	
R-	WP	APPS\WORD	
RWC	EMAIL	APPS\HIGGINS	
***	PRINTER	PRN	
***	LASER	COM1	

The columns in this display list:

Access/Status	Shows which <i>permissions</i> are granted for that directory; permissions control whether you can read files in a directory (R); write files (W); and create new files (C). If the offered resource is a printer, this column contains three asterisks (***)
Network Name	Gives the alias for that directory.
DOS Name	Gives the drive specification and path name for that directory.
Names Using Device	Lists the names of work stations currently connected to the resource. Since you usually use SHARE with the /O switch, this column is shown empty.

REFERENCE

Division 3, pages 8-3, 8-4

DISPLAYING PRINTER STATUS

The remote server command **PRINT** (with no command line arguments) will provide a display of the status of each printer attached to a server, and will provide a display of the files in the print queue. At the Server: prompt type:

Server: **PRINT** **Enter**

A list similar to the following will be displayed:

Printer LPT1

Printer is on
Printer is idle
Print separator is off

Printer COM1

Printer is on
Printer is busy
Print separator is off

PQ009	(COM1)	(MARTHA)	33144 Revised Price list 6/8/86 to all
PQ010	(COM1)	(BART)	11001 MEMO: distribution FROM

REFERENCE

Division 3, pages 8-5, 8-6



3 COMMAND CHEAT SHEET

APPEND

To define a search path for data files:

APPEND [<drive>:]<pathname>[;<drive>:][<pathname>][;...]

[<drive>:]<pathname>

The drive plus pathname of the directory containing the file you want to use. You can specify multiple search paths by separating each path with a semicolon (;); do not exceed 128 characters in the line.

To display the list of appended directories:

APPEND

To cancel the previous APPEND command without specifying other directories to be searched:

APPEND ;

NET CONTINUE

To resume disk redirection, type:

NET CONTINUE {DISK REDIRECTION}
{DRDR}

To resume print redirection, type:

NET CONTINUE {PRINT REDIRECTION}
{PRDR}

NET HELP

NET HELP <command>

or

NET <command> HELP

or

NET HELP

<command> is a Net/One PC Workstation command:

CONTINUE	HELP	NAME	PAUSE
PRINT	START	USE	SERVER

NET NAME

NET NAME

NET PAUSE

To suspend disk redirection, type:

NET PAUSE {DISK REDIRECTION}
{DRDR}

To suspend print redirection, type:

NET PAUSE {PRINT REDIRECTION}
{PRDR}

NET PRINT

To print a file on a network printer, type:

NET PRINT [<drive>:][<path>]<filename> <device>

To display the status of a server's print queue, type:

NET PRINT <server name>

To display the status of the print queue for a particular print device, type:

NET PRINT <device>

Command line arguments:

[<drive>:][<path>]<filename>

The name of the file to print. The filename can include a drive and path specification.

<device> the name of a redirected print device.

<server name> the name of a server.

NET SERVER

NET SERVER <server> [<password>]

<server> is the network name of the server you wish to log on to.

<password> is an optional password which gives access to restricted server commands.

NET START

NET START <type> <network name>

<type> selects a startup configuration appropriate for your network adapter and operating requirements (your network manager will usually select this). Valid choices are:

NRDR 3RDR URDR U2RDR
CRDR C2RDR C3RDR
TRDR T2RDR
IRDR I2RDR I3RDR

<network name> is the name by which your workstation will be known to the network. Usually just your name is sufficient (as long as it's unique)

NET USE

To connect to a server directory:

NET USE <drive>: [space] \\<server>\<alias> [space] [<password>] [Enter]

To connect to a server printer:

NET USE <device> [space] \\<server>\<alias> [space] [<password>] [Enter]

To disconnect a server directory or printer:

NET USE <drive>: [space]/D [Enter]
<device>

To display current connections:

NET USE <device> [Enter]

<drive>: The letter associated with a disk drive on a workstation (A: through Z:).

<device> The name of a printer device:
 LPT1: LPT2: LPT3: PRN:

<server> The network name of the server you wish to connect to.

<alias> The name by which the resource you are connecting to is known.

<password> An optional word required to gain access to the resource; see your network manager.

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Net/One PC System

Workstation User's Guide

THE UNIVERSITY OF CHICAGO

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INTRODUCTION

If you've never used a personal computer on a network, you're in for an eye-opening experience. The network gives you power and resources beyond those available from even the most advanced PC. Even if you have a simple PC equipped with only floppy diskettes, you'll now have access to lots of hard disk storage, and you'll have new options for using printers shared with other users.

There's a lot of application software that takes advantage of the power of a network. Examples are electronic mail systems to let you send, receive, and manage your departmental communications quickly. Multi-user database programs let you develop information systems to share data with everyone in your department, and control the flow of information.

On top of the convenience of a network, you'll find that the network is very fast. When you're reading data from the hard disk on another computer on the network (called a *server*), most of the time the data comes over the network as fast as if you read it from your own local disk (and usually faster than your local floppy disk).

In the area of printing you'll see a spectacular improvement. Before you were connected to a network, printing from a program to a printer took a relatively long time: your application program could only send data to the printer as fast as its mechanism could work. With Net/One PC System in place, you can send data to a server to be printed just as fast as your program can generate it. That's because the server receives your data at network speeds--millions of bits per seconds--and stores it on a disk before printing it. You can be back to work in a fraction of the time.

Net/One PC System is the software which works with an Ungermann-Bass network to bring you these benefits. There are ten commands which control the network; of those, you'll end up using only a couple on a regular basis. It's really pretty easy to start using the network. If you're anxious to get some experience right away, Chapter 2 is a "Quick Start" exercise which lets you see the network at work in just a few minutes.

The rest of this chapter will introduce you to some of the inner workings of Net/One PC System, the terminology we'll be using to talk about it, and networking concepts which will help you get the most from Net/One PC System. We'll start by giving you a general outline of how networks work, and then show you how Net/One PC System connects you to the network.

WHAT IS A NETWORK?

Webster's *Ninth New Collegiate Dictionary* defines a *network* this way:

network 1: a fabric or structure of cords or wires that cross at regular intervals and are knotted or secured at the crossings;...3a: an interconnected or interrelated chain, group, or system; 3b: a system of computers, terminals, and databases connected by communications lines.

Definition 3b is the most technically correct, of course, but definition 1 tells you more about the way a network is set up (rest assured we do our best to keep our wires from crossing, though!). A network is a structure of wires which may cross and crisscross through a building, and connects to computers, terminals, and personal computers at the crossings (in technical jargon the crossings and connections are called *nodes*).

Information is sent over the wires from computer to computer, computer to terminal, terminal to printer, computer to printer....from any point to any other point. If you could trace the paths data takes as it moves from place to place, it really would start to look like a fisherman's net.

A Net/One network has built-in data managers and controllers to keep things moving smoothly, and, most important, to share the network efficiently among all the different people and computers using it. As you begin to work with the network, realize that while you're using it, potentially thousands of others could be using it at the same time.

There are a few network technical terms which you may need to know. Most aren't important in your day to day work; but sometime you may have to explain some problem you're having to your network manager, and it will help a lot to be able to use the correct terms.

network manager: every system has an individual who is responsible for making sure things go smoothly. Your network manager may install the network, and will install the Net/One PC System software on your workstation. The network manager sets up the resources you can use over the network, and should be able to help you when you have problems.

network interface adapter: this is the card in your personal computer which connects to the network. It takes data from programs and sends it over the network, and receives data from the network and passes it on to applications. Some networks also have a *modem* between the network adapter and the network cable; you'll recognize it as a rectangular beige box sitting on your computer or tucked away in a corner.

network name: everyone and everything connected to the network has a special name by which he, she, or it is known to the network. When one computer wants to talk to another, it addresses its message to the other computer by its network name. A network name must be unique on a given network, to keep the wires from getting crossed, but the same names might be used on different networks.

network address: every network interface adapter also has a unique serial number by which it is known to the network. Ungermann-Bass assigns these numbers and fixes them into the hardware, so that a given network address is unique throughout the world.

WHAT IS Net/One PC SYSTEM?

Net/One PC System ties together a group of personal computers over a Net/One network. It's designed to bring together a department-size workgroup: anywhere from a half dozen to a hundred people who need to communicate and share data and common resources. As we mentioned earlier, a Net/One network can simultaneously support many users, so your network cable could be handling the work of many other Net/One PC System workgroups, as well as the data passed from computers and terminals you never know exist.

Most of Net/One PC System works behind the scenes, and you don't usually notice it. That's because Net/One PC System is a *network operating system*, and a good operating system is as unobtrusive as possible.

You're already familiar with DOS, your PC's Disk Operating System. DOS is the software that is loaded first into your PC when you start it up, and remains there while you work. DOS manages the computer's hardware on behalf of the software you run, or when you give it commands directly at the **A>** prompt. When a program wants to read or write data on a disk, it asks DOS to find the data, and to operate the disk controller card which operates the mechanism of the disk. Similarly, when a program wants to display something on the screen it sends the data to DOS, which puts it on the screen. The same things happen with characters you type at the keyboard: DOS gets them from the keyboard, and passes them on to a program.

A network operating system like Net/One PC System is an add-on to DOS to let you and your application programs work with disks and printers on other computers. Net/One PC System is loaded into your computer after DOS, and links itself into DOS. After you give it a few commands telling it what resources on other computers you wish to use, Net/One PC System communicates with those other computers over the network, managing the flow of data.

Here's the important thing about Net/One PC System: once you've told it what other disk and printer resources on the network you want it to use, you can use them just like any other DOS resource. For example, if you've connected to a disk resource on another computer and called it drive **D:** (we'll explain how you do that later), **DIR D:** works just like **DIR A:**: **DIR A:** lists the files on a diskette in your PC's drive, and **DIR D:** lists the files on the remote computer. In the same way, if you've connected to a network printer and called it **LPT1:**, then any program which prints to **LPT1:** will end up printing on the network printer.

Redirection

The technical term for what Net/One PC System does is called *redirection*. Net/One PC System redirects operations with disk drives and printers over the network to devices somewhere else on the network.

The fundamental Net/One PC System command, which you'll be using most often, is **NET USE** (the command is explained in detail in Chapters 3, 4, and 5; for now we're just concerned with what it accomplishes). You use **NET USE** to tell Net/One PC System, in effect, "redirect my local drive **w** to network disk resource **x**", or "redirect my local printer port **y** to another computer's printer **z**". From then on, Net/One PC System makes it look like you've added another drive and another printer to your PC.

Ungermann-Bass can also provide a very easy to use tool to control Net/One PC System called *Connection Manager 2*. Connection Manager 2 is a program which you load into your personal computer, and which remains there in memory. When you need to make or break a network connection, redirect a printer, check the status of your print files, etc., you press a special key combination and Connection Manager "pops up" in a window on your screen. If you already have Connection Manager 2 your network manager will have inserted its documentation into the tab in this binder labelled *Connection Manager*; if not, you will find documentation there for a simpler version of Connection Manager (called simply, "Connection Manager").

Workstations and Servers

Up till now we've just referred to "the other computer" you connect to. A Net/One PC System system consists of two kinds of computers: *workstations* and *servers*. Your personal computer is a workstation; it's where you work.

A server is a personal computer which does nothing but provide central disk storage and central printer services to workstations; it is the "other computer" that serves workstations. Your network manager will set up one or more servers for you, and give each one a name to identify it.

Network Resources

Your network manager sets up a list of *offers* on the server, which are the resources available for you to use from your workstation. There are two kinds of offers:

Disk offers are directories on the server's hard disk.

The network manager tells the server to make files in a directory available to a workstation, and sets restrictions on your access to the files if necessary.

Each disk offer has an *alias*; the alias is a sort of nickname by which you identify the offer. For example, if your network manager has set up the ACCTG server to offer a directory containing accounting files to the network with the alias ACCTDATA, you, in turn, could give the Net/One PC System software in your workstation the NET USE command to redirect your drive Q: to ACCTDATA on server ACCTG.

Printer offers are printers connected to a server.

You and your application programs can send data over the network to a server, where the data will be stored on disk and then sent to the printer.

Note the part about the data being stored first on disk. At the beginning of this chapter we mentioned how fast you could print on a network printer. The reason is that the server doesn't send your data to the printer right away; and thus it doesn't have to wait for the printer to work. The server takes the data you send it at network speeds, stores it on disk, and then sends it to the printer, a little bit at a time, as slowly as the printer can accept it. Meanwhile, you've gone back to work.

Printer offers also have aliases, like disk offers. If there's a printer on the **DEPT** server called **LETRQUAL**, you can use **NET USE** to instruct Net/One PC System to redirect your local **LPT2:** printer over the network to it.

Devices and Device Names

A device is a piece of hardware, such as a disk drive or printer, that is attached to your computer. Each device is known to DOS by a unique name, which always ends with a semicolon (":"). Disk drives have single letter names from **A** through **Z**. Your floppy disk drives are named **A:** and **B:**, and your hard disk drive letters run from **C:** on. Printers can be given the names **LPT1:**, **LPT2:**, **LPT3:**, and **PRN:**. Net/One PC System reassigns these DOS device names to the server resources you tell it to connect to.

Passwords

There are times when your network manager must restrict access to data on disk, and sometimes restrict access to printers as well. He or she does this by assigning a password to an offer; only users who know the password can use Net/One PC System to connect to that resource.

Pathnames

A pathname is a unique name that identifies a file by its location in the file system. You're probably familiar with "local" pathnames that define the location of a file within a particular directory on a particular disk. A local pathname is formally defined to consist of the following parts (each item between brackets is optional):

[drivename:][directory]\<filename>

In English, this means that a pathname will always consist of a filename, and may optionally specify the drive and directory where the file will be found. There can be only one drive, but the directory specification may have to list a directory, subdirectory, sub-subdirectory, etc; each directory name is separated by a backslash ("\"). For example, if the file *CUSTOMRS.DTA* is located on drive C:, in the subdirectory *PAYABLE* under the directory *ACCTS*, the pathname would be:

C:\ACCTS\PAYABLE\CUSTOMRS.DTA

Net/One PC System uses a similar device, called a *network pathname*. Network pathnames resemble DOS pathnames, but specify a server and an offer. The formal definition of a network pathname is:

\\<server>\<offer>

Note that a network name has two backslashes preceding it. You'll mostly encounter network pathnames when you specify a connection with **NET USE**. Certain other commands which require you to specify a server must have the two backslashes before the server name.

If you need more information about pathnames, refer to the section "Files and Directories," in the *DOS User's Guide*.

INTRODUCTION

This chapter guides you through a simple exercise to demonstrate how you connect to the network. It also shows you how to get help from the software if you need it.

Before you can proceed with this practice session your network manager must have set up a functioning network, with at least one server; and should have set up the network software on your workstation. If you have a personal computer with a hard disk, the network software will automatically run when you boot your computer. If you have a personal computer using only floppy disks, you will need to start the computer with the network boot disk the manager gave you (a diskette containing both DOS and the Net/One PC System software). You must also know the network name of the server that contains the directory *DEMO*.

If you have questions about any of these things, check with your network manager.

GETTING HELP

You can display information about using network commands by using the on-line help feature. See Table 2-1.

Table 2-1
Online HELP Commands

For Information About..	Type:
NET CONTINUE	NET CONTINUE HELP NET CONT HELP NET HELP CONTINUE NET HELP CONT
NET NAME	NET NAME HELP NET HELP NAME
NET PAUSE	NET PAUSE HELP NET HELP PAUSE
NET PRINT	NET PRINT HELP NET HELP PRINT
NET START	NET START HELP NET HELP START
NET USE	NET USE HELP NET HELP USE
NET VER	NET VER HELP NET HELP PRINT
(command summary)	NET HELP

STARTING DOS AND THE NETWORK

To begin the practice session, start your computer with the Net/One PC System software. If you have a workstation with a hard disk the network manager should have set it up to run automatically when the workstation is turned on (or rebooted).

If you have a workstation which uses only floppy diskettes, put the network software diskette (containing both DOS and the Net/One PC System software) in drive A:.

If your computer is off, turn it on.

If your computer is already running, restart it by holding down the **Ctrl**, **Alt**, and **Del** keys simultaneously. (From now on, this manual will just tell you to press **Ctrl Alt Del** to *reboot* your computer).

Follow your normal procedure when starting the computer (for example, entering the date and time if the computer asks for it). You will see a series of messages while the network software is loading; if all is going well, you will see:

PERSONAL CONNECTION: passed its diagnostic test

and, possibly, a series of messages like:

(command completed successfully)
(command completed successfully)

At the end you will see a display which shows you the network name of your own computer. Finally, you will see the standard DOS prompt.

If the computer displays error messages while you are starting the network, see your network manager.

CONNECTING TO A SERVER

In order to make use of the resources of a server you must first *connect* to it. You do this with the **NET USE** command.

NET USE establishes a connection with a server (using the name of the server supplied by your network manager), and connects to a specific directory on that server. In this practice session we'll connect to a demonstration directory called **\\DEMO**, and call it drive **D:**. By giving a server directory the name of an unused disk drive on your workstation, you and your application programs can use it just like a local disk drive.

NOTE Drive **D:** is available on most computers which use just two diskette drives, or have just one hard disk drive (named drive **C:**). If your computer already uses drive **D:** just substitute an unused drive letter, such as **E:**, **F:**, etc., in the following examples.

To connect to the demo directory type:

NET USE D:

Make sure you type a space between the colon (:) and the first backslash. The **<name>** is the network name of the server that contains the directory **\\DEMO**. If you successfully connect to **\\DEMO**, your screen will display the message:

command completed successfully

If you see any other message, refer to the list of **NET USE** error messages in Chapter 2. If you still can't resolve the problem, consult your network manager.

From now on, the contents of *DEMO*, on the server, will be available to you, at the workstation, as drive D:. You're free to use DOS commands such as **DIR** and **TYPE** to work with it, which we'll do in the next part of the exercise.

LISTING A REMOTE DIRECTORY

The DOS directory command will display the files contained in *DEMO*; all you do is ask for a directory of drive D:. Type:

DIR D:

A listing of the files contained in *DEMO* will be displayed on your screen. There will probably be only one file; the screen should look something like the following:

```
. <DIR>      1-01-80  3:19a
.. <DIR>      1-01-80  3:19a
SAMPLE      75  1-01-80  3:17a
```

LOOKING AT A REMOTE FILE

The DOS **TYPE** command will display the contents of a remote file, in this case the file in *DEMO* called *SAMPLE*. Type:

TYPE D:SAMPLE

Your screen should look like this:

You can use files in a remote directory just as if they were on a disk in one of your own disk drives.

SUMMARY

Now that you've completed the practice session, you're ready to learn how to take advantage of the power of Net/One PC System. The next three chapters cover the basics:

Chapter 3: how to use **NET USE** to connect to, and disconnect from, a server.

Chapter 4: how to use a remote printer (a printer attached to a server).

Chapter 5: how to use files on a server.

The last two chapters of this manual cover more advanced topics:

Chapter 6: useful DOS commands.

Chapter 7: customizing your workstation's **AUTOEXEC.BAT** file.

Chapter 8: how to give commands to a server from your workstation.

CONNECTING TO A SERVER

INTRODUCTION

This chapter covers the general methods for connecting to servers, using their resources (directories and printers), and disconnecting from servers. The command that lets you do this is called **NET USE**.

This chapter introduces the **NET USE** command, and provides general pointers for using it. Later chapters give details about using it in specific situations:

Chapter 4 describes connecting to remote printers with **NET USE**;

Chapter 5 describes connecting to remote directories with **NET USE**.

Online Help	
For Information About..	Type
NET CONTINUE	NET CONTINUE HELP NET CONT HELP NET HELP CONTINUE NET HELP CONT
NET PAUSE	NET PAUSE HELP NET HELP PAUSE
NET USE	NET USE HELP NET HELP USE
(command summary)	NET HELP

USING THE NET USE COMMAND

The **NET USE** command connects your computer to a network resource, and gives the network resource a name that DOS can work with: a disk drive letter like **W:** or **G:**; or the name of a printer, **LPT1:**, **LPT2:**, or **PRN:**. This local name for a network resource is called its *alias*. After **NET USE** has set up this connection, DOS and application programs can use the resource just as if it was a local drive or printer, by referring to the resource by its alias.

There are three formal definitions of the **NET USE** command, as shown in Table 3-1.

Important points about NET USE

- The **<device>**: name (drive letter or printer device) must **always** be followed by a semicolon (";"). If you leave it out you will get an error message.
- Each **[space]** in the command is significant; if you leave one out you will get an error message.
- The name of the server must **always** be preceded by two backslashes ("\\").
- The **<device>**: name used when connecting to a remote directory should be the name of an unused drive on your computer. For example, if your workstation has a one hard disk drive it will be named drive **C:**; therefore, you can use any drive letter from **D:** through **Z:** for **<device>**.

You aren't forbidden from using the name of a drive which already exists on your computer; but if you do, the existing drive will be made unavailable, and the newly connected remote directory will take its place.

Table 3-1
NET USE Command
(General Forms)

SYNTAX

To list existing connections:

NET USE

To connect to a server resource:

NET USE <device>: \\<server>\<alias> []

To disconnect from a server resource:

NET USE <device>: /D

COMMAND LINE ARGUMENTS

<device>: The name of an unused device on your computer:
 drive letters A: through Z:
 printer device names PRN:, LPT1:, LPT2:.
 Note that both drive and printer names have a colon (":") after them.

\\<server> The network name of the server you want to connect with. Note that server names always begin with two backslashes ("\\").

<alias> The alias of the directory or printer.

[password] Your network manager will give you this password if it applies. (optional)

/D A switch used when you want to disconnect from a directory or printer. Explained later in this chapter. (optional)

- The <device>: name used when connecting to a remote printer should also be the name of an unused printer device on your computer. However, since most application programs default to LPT1:, you should probably use it as your remote printer.
- Your network manager must provide you with a list of names of available servers. You can't connect to a server unless you know its name.
- Your network manager will also provide you with a list of the aliases for each server. You can also find out for yourself what resources a server offers (as long as you know the name of the server) with a remote status display, as described in "Remote Server Commands" in Chapter 9.

NET USE Messages

- When **NET USE** succeeds in establishing a connection it will display the message:

command completed successfully

- If you accidentally specify a <device> which has already been connected to the network, **NET USE** will display the message:

Drive in use

Note that this message refers to both printers and disk drives.

- If you leave out a required password, or misspell a password or alias, **NET USE** will display the message:

Invalid shortname or password

Examples

(Later chapters will present more detailed examples when they explain specific ways to use **NET USE**. These examples show the general appearance of two forms of **NET USE**.)

NET USE D: \\FINANCE\ACCOUNTS

connects your local drive **D:** to the directory called **ACCOUNTS** on the server called **FINANCE**.

NET USE LPT1: \\CENTRAL\LASER

connects your local printer port **LPT1:** to the printer resource called **LASER** on the server called **CENTRAL**.

LISTING REMOTE CONNECTIONS

You can get a display of the existing connections between your workstation and servers by typing the **NET USE** command on a line by itself. Type:

NET USE

If connections have already been made between your workstation and servers **NET USE** will display a screen similar to the following:

Status	Local Device	Network Name
	D:	\\finance\accounts
	E:	\\finance\orders
	LPT1	\\central\laser

Command completed successfully.

The example shows connections to two servers: **FINANCE** and **CENTRAL**. The first two lines list connections to remote directories: local drive **D:** is connected to the directory **ACCOUNTS**, and local drive **E:** is connected to the directory **ORDERS**. The local printer device **LPT1** is connected to the network printer named **LASER** on server **CENTRAL**.

If no devices are connected to the network, the following message appears:

No entries in list.

DISCONNECTING FROM THE SERVER

Most of the time you'll establish network connections and then leave them. Often your workstation's **AUTOEXEC.BAT** file contains **NET USE** commands which establish connections when you turn on your workstation, and they remain in effect until you turn the workstation off again.

Sometimes, though, you will need to break an established connection:

- You might want to change the connection for a specific <device> from one server resource to another; you have to break the first connection before you can establish another.
- Sometimes you'll have a local printer attached to **LPT1:**, but then you redirect **LPT1:** to a network printer. For example, you might use a network letter quality printer for document printouts, but then have to use a local dot matrix printer for graphics. When you disconnect **LPT1:** from the network printer, your local printer automatically is available as **LPT1:**
- There are occasions when it makes sense to redirect a "real" local drive to a network directory (of course, when you do this the local drive is "covered up" by the network directory). For example, some programs insist on using a particular drive, say **B:**, for data; you can "fool" the program by redirecting **B:** to a network drive. However, when you want to use **B:** as its original self, you must disconnect the network directory which covered it up.

You can disconnect from a network resource either temporarily, or permanently. When you disconnect permanently, the connection is gone until you issue another **NET USE** command to reestablish it. When you disconnect temporarily, the network connection is suspended, and you can use a local resource by the same name until you resume the network connection.

Disconnecting Permanently

To disconnect a drive or printer <device> from a server use the **NET USE** command with the **/D** switch, like this:

NET USE <device> /D

You cannot disconnect from a drive while you are using it (for example, if your DOS prompt shows you are working in the drive you are trying to disconnect). If you try to do so, you will see the message:

Cannot disconnect from current drive

Switch to another drive, then use the disconnect command again.

Example

To disconnect drive **D:** of your workstation from a server, make sure your current drive is not drive **D:**. If it is, switch to another drive, **A:** for example, by typing:

A:

Next, type the following command to disconnect drive **D:** from the network:

NET USE D: /D

Disconnecting Temporarily

The **NET PAUSE** and **NET CONTINUE** commands suspend and resume redirection of local devices to the network. The commands work by suspending and resume either all disk drive redirection, or all printer redirection; they cannot specify individual devices.

While disk redirection is paused you can use the drive letters which were redirected to the network to access your own local disks and directories. Similarly, while print redirection is paused you can use local printers attached to printer ports which were redirected.

When you resume disk redirection with **NET CONTINUE** all local disk drives are reconnected to the same server resources as they were before you used **NET PAUSE**. Similarly, printers are reconnected to their network printers.

The formal definition of **NET PAUSE** is shown in Table 3-2; the formal definition of the **NET CONTINUE** command is shown in Table 3-3. There are two alternatives with each command, disk or print redirection. Each alternative has two forms: spelled out, and a short four letter abbreviation.

Example

If your workstation's **LPT1:** device has been redirected to a network laser printer, the DOS command:

COPY TEXTFILE.DOC LPT1:

sends the file *TEXTFILE.DOC* to the laser printer. After you issue the command:

NET PAUSE PRDR

the same **COPY** command causes the file to be printed on a local printer. After you give the command:

NET CONTINUE PRDR

the **COPY** command again sends the file to the network laser printer.

Table 3-2
NET PAUSE Command

SYNTAX	
NET PAUSE	{DISK REDIRECTION} {DRDR} <input type="button" value="Enter"/> {PRINT REDIRECTION} {PRDR}
COMMAND LINE ARGUMENTS	
DISK REDIRECTION	
DRDR	Suspends redirection of local disk drives to network directories.
PRINT REDIRECTION	
PRDR	Suspends redirection of local printer devices to network printers.

Table 3-3
NET CONTINUE Command

SYNTAX	
NET CONTINUE	{PRINT REDIRECTION} {PRDR} <input type="button" value="Enter"/> {DISK REDIRECTION} {DRDR}
COMMAND LINE ARGUMENTS	
DISK REDIRECTION	
DRDR	Resumes redirection of local disk drives to network directories.
PRINT REDIRECTION	
PRDR	Resumes redirection of local printer devices to network printers.

USING REMOTE PRINTERS

INTRODUCTION

This chapter covers the techniques which let you use printers attached to a server from a workstation.

Topics covered in this chapter:

- the server's print queue and print spool files
- how to connect to a server printer
- how to disconnect from a server printer
- how to get a list of server printers
- how to print files from DOS, and from an application program
- how to display the status of server printers

Online Help	
For Information About..	Type:
NET PRINT	NET PRINT HELP NET HELP PRINT
NET USE	NET USE HELP NET HELP USE
(command summary)	NET HELP

REMOTE PRINTING

Net/One PC allows a printer on a server to be shared by people at many workstations. The server does more than just connect workstations to printers; it receives streams of data from workstations as fast as the network is capable of sending them, stores the data in files on disk, and then sends it out to the printer at the speed at which the printer can accept the data (usually much slower than the network). This operation is called *spooling*, and its most noticeable benefit is that your application programs appear to finish printing very quickly; you get back to work much sooner than if you were printing to a locally attached printer.

A related benefit of spooling is called *queueing*. What happens if two or more workstations try to send data to the same server printer simultaneously? The server handles this situation gracefully: it stores the incoming data from all the workstations on disk, and then sends the stored print data out to the printer in the order the workstations finished sending the data. The workstations all eventually get their files printed, in a "first in, first out" order.

The collection of files waiting on disk to be printed is called the *print queue*. Later in this chapter we'll show you a command which lets you look at the files waiting in the print queue, so that you can check on the status of your own print jobs.

CONNECTING TO A REMOTE PRINTER

To use a server's printer, you must link a printer device on your computer to the server printer with the **NET USE** command. The printer devices on your workstation are **LPT1:**, **LPT2:**, and **PRN:**. The printers on a server are identified by aliases assigned by the network manager.

Connecting to a Printer with NET USE

The **NET USE** command that connects a local device to a server printer has the form shown in Table 4-1. Note that **LPT1:** and **PRN:** refer to the same device. You can redirect one or the other, but not both simultaneously.

Example

The following command connects the local device **LPT1:** to a remote printer named **LPRINTER** on a server named **FINANCE**.

```
NET USE LPT1: \\FINANCE\LPRINTER 
```

Disconnecting From a Server Printer

You can break the connection between a workstation device and a server printer with the **/D** switch of the **NET USE** command:

```
NET USE <device> /D 
```

Example

To disconnect **LPT1:** from the remote printer, type:

```
NET USE LPT1: /D 
```


Table 4-1
NET USE Command
(Connecting to a Printer)

SYNTAX

NET USE <device>:[space] \\<server>\<alias> [[space]<password>][Enter]

COMMAND LINE ARGUMENTS

<device>	The name of a local workstation print device: LPT1: or PRN: LPT2:, LPT3:
<server>	The name of the server to which you're connecting.
<alias>	The name of the printer assigned by the network manager. The network manager will give you a list of aliases, or you can display a list of server printers yourself as described later.
[<password>]	Some printers can't be used unless you supply a password. The network manager will provide the password to use these printers.

PRINTING FILES FROM DOS

The Net/One PC System command which prints a file on a remote printer is **NET PRINT**. The formal definition of **NET PRINT** is shown in Table 4-2.

When you use **NET PRINT** the file named in the command is sent over the network via the specified device to the server's print queue. The server prints the file as soon as the printer is available.

DOS provides alternative ways to send a file to a network printer. You could use the DOS **COPY** command, or you could use a DOS "pipe" to redirect output from a command or program to a network printer.

Examples

The following commands print the file **MEMOS** on a network printer through **LPT1::**

NET PRINT MEMOS LPT1:

COPY MEMOS LPT1:

TYPE MEMOS > LPT1:

Table 4-2
NET PRINT Command

SYNTAX

NET PRINT <filename> <device>

COMMAND LINE ARGUMENTS

<filename>	The name of the file you want to print, including a pathname if applicable.
<device>	The name of the device on your computer that you connected to the remote printer.

PRINTING FROM AN APPLICATION

Once you've established a connection from a local print device to a server printer, any application program can send data to the server printer through that print device. For example, once you've used the command:

NET USE LPT1: \\CENTRAL\\LASER 

the output from any program that sends data to **LPT1:** goes to the printer **LASER** at the server **CENTRAL** automatically. You don't have to do anything special to make an application program work with a network printer.

PRINTER DISPLAYS

There are three displays you can get which help you use server printers. Two displays are available through remote server commands (as explained in Chapter 8):

- **PRINT** (remote) displays the current status of the server printers, and lists files in the print queue.
- **STATUS** (remote) displays a summary of server status, including a list of available printers with their aliases.

The third command is one which you can type at the DOS prompt to display the status of a server's print queue: **NET PRINT** without command line arguments. This display is useful when you want to find out how many files are waiting to be printed, the position of your own print job in the queue, etc. There are two variations on this usage of the **NET PRINT** command, one specifying a server, the other specifying a printer.

Displaying Print Queue Status from a Specific Server

To display the status of a server's print queue, type:

NET PRINT \\<server>

<server> is the name of the server; note the double backslashes ("\\") in front of the name. You can specify the name of any server which is on line, which is handy for locating a printer which is not busy.

If **NET PRINT** can't find the server, you will see the error message:

Network path not found

If a print queue is empty, you will see the message:

Queue is empty

Displaying Status of a Specific Printer

To display the status of the print queue for a particular print device, type:

NET PRINT <device> 

<device> is the name of the print device: **LPT1:** through **LPT3:**, or **PRN:**. If you specify a printer that has not been redirected with **NET USE**, you will see the message:

Device is not redirected.

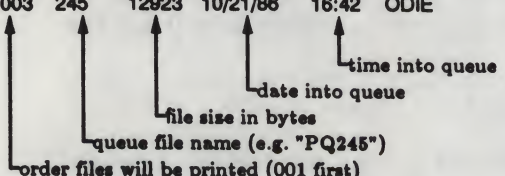
If a print queue is empty, you will see the message:

Queue is empty

Print Queue Display

If the **NET PRINT** command is successful, it will display a screen something like this:

		workstation sending file		current status of file		
Pos	ID	Size	Date	Time	Name	Status
001	240	22580	10/21/86	16:41	MARMADUKE	PRINTING
002	242	372	10/21/86	16:41	GARFIELD	
003	245	12923	10/21/86	16:42	ODIE	



The columns in the display have the following meaning:

Pos	The position of the file in the queue; position 001 is the first file, and is usually printing at the time of the display.
ID	The name of the file; this is the numeric portion of the spool file name. For example <i>PQ036</i> is listed as "036".
Size	The size of the file in bytes.
Date, Time	The date and time the workstation finished transmitting data into the file, and the file was closed.
Name	The network name of the workstation sending the data.
Status	Indicates whether the file is currently Printing, or Waiting to print.

THE **PrtSc** KEY

DOS has two special key combinations which echo screen output to the printer: **Shift PrtSc**, which copies the current display to the printer; and **Ctrl PrtSc**, which echoes every character typed subsequently at the keyboard to the printer. Both these functions send their output to **LPT1**; if **LPT1** has been redirected to a server printer, these functions will not work.

If you want to use these two functions with a local printer, you can use the **NET PAUSE** command to temporarily remove the printer device from the network; type:

NET PAUSE PRDR **Enter**

or

NET PAUSE PRINT REDIRECTION **Enter**

You can use **Shift PrtSc** or **Ctrl PrtSc** while print redirection is suspended. When you are done, type:

NET CONTINUE PRDR

or

NET CONTINUE PRINT REDIRECTION

to place the printer back on the network.

INTRODUCTION

This chapter describes techniques for using files located on a server. From your workstation, you can run programs stored on the server, and use data files on the server as well.

Topics covered:

- The **NET USE** command
- Protected directories
- Shared files
- Running programs located on a server
- Running workstation programs using data files on a server

Online Help	
For Information About..	Type:
NET USE	NET USE HELP NET HELP USE
(command summary)	NET HELP

THE SERVER DISK

The network manager sets up each server to offer its directories to the network; you can use the files in these shared directories from your workstation. Each offered directory is known to the network (i.e., to you at your workstation) by its alias.

Figure 5-1 shows the structure of a typical server disk (the server may have other directories, but, for this example, these are the ones offered to the network). The figure shows that:

- the entire disk is available, from the root directory down, through the alias "MASTER";
- the server's *WP* directory (containing a word processing system) is available through the alias "WORDPROC";
- similarly, database and mail applications in the server's *DBMS* and *EMAIL* directories are available through the aliases "DATABASE" and "MAIL";
- accounting data files, in the directory *ACCOUNTS* plus its subdirectories *RECVABLES*, *PAYABLE*, and *OVERDUE*, are available through the alias "ACCTS";
- the subdirectories under *ACCOUNTS* are available individually through their own aliases: "ACCTS.RCV", "ACCTS.PAY", and "ACCTS.OVR".

Figure 5-1 illustrates an important point about server directories and aliases: there can be different aliases which give you a greater or narrower range of access to the server's disk. Aliases can overlap, and two aliases could even be assigned which describe exactly the same set of directories.

Figure 5-1

At first the number of overlapping aliases may seem confusing, and an unnecessary duplication of aliases; after all, you could get at all of the disk with the single alias "MASTER". However, Net/One PC System allows the network manager to assign passwords and other kinds of restrictions to each alias. The network manager uses multiple aliases to control access to the individual portions of the server disk. The subsection "Protected Directories" below explains the types of restrictions the network manager could associate with aliases.

The NET USE Command

NET USE connects your workstation to a server directory by associating a disk drive letter on your workstation with the alias of the server's directory. The definition of this form of **NET USE** is shown in Table 5-1.

Important points about NET USE

- The <drive>: name used when connecting to a remote directory should be the name of an unused drive on your computer. For example, if your workstation has one hard disk drive it will be named drive C; therefore, you can use any drive letter from D: through Z: for <drive>.

You aren't forbidden from using the name of a drive which already exists on your computer; but if you do, the existing drive will be made unavailable, and the newly connected remote directory will take its place.

- Your network manager should provide you with a list of the aliases for each server. You can also find out for yourself what resources a server offers (as long as you know the name of the server) with the remote server commands **SHARE** or **STATUS**, as described in Chapter 8.
- When **NET USE** succeeds in establishing a connection it will display the message:

command completed successfully
- If you accidentally specify a <drive> which has already been connected to the network, **NET USE** will display the message:

Drive in use

Table 5-1
NET USE Command
(Connecting to a Server Directory)

SYNTAX

NET USE <drive>: [space] \\<server>\<alias> [space] [<password>] [Enter]

COMMAND LINE ARGUMENTS

<drive>:	The name of an unused drive on your computer; this is a drive letter, A: through Z:, which is not already used. Note the colon (":") after the drive letter.
\\<server>	The network name of the server you want to connect with.
<alias>	The alias of the directory.
[<password>]	Access to some directories may be restricted to those who know the password. Your network manager will have to give you this password if it applies. (optional)

- If you leave out a required password, or misspell a password or alias, **NET USE** will display the message:

Invalid shortname or password

Examples

Let's return to the example server disk shown in Figure 5-1; in these examples we'll assume that the server is called **SERVER**, and that the network manager has not restricted access to any of the directories with passwords.

Example 1

To gain access to the entire disk from the root directory, enter the command:

NET USE X: **\\SERVER\MASTER**

This command connects your workstation's drive **X:** with the root directory, via the alias "**MASTER**". When you log on to this drive by typing:

X:

you will be able to access the files in the root directory as well as all other subdirectories. You can get a list of the subdirectories available from the root by typing the command:

DIR *

The resulting display would show:

Volume in drive X has no label
Directory of X:\

ACCOUNTS	<DIR>	3-11-86	5:19a
EMAIL	<DIR>	5-15-86	7:55p
WP	<DIR>	1-30-85	3:22a
DBMS	<DIR>	8-12-86	9:59p

Example 2

To connect the *ACCOUNTS* directory on the server to your workstation's drive *Q:*, type:

NET USE Q: **\\SERVER\ACCTS**

When you log on to drive *Q:* by typing:

Q:

and then use the command:

DIR *

you will see this list of the subdirectories available below *ACCOUNTS*:

Volume in drive Q has no label
Directory of Q:\

RECVABLE	<DIR>	9-22-83	8:22a
PAYABLE	<DIR>	1-15-86	1:21p
OVERDUE	<DIR>	3-14-85	7:55a

PROTECTED DIRECTORIES

Your network manager may elect to restrict access to directories through two mechanisms: passwords, and restrictions on the types of operations that can be performed on the files in a directory. The latter means that the ability to read, write, or create a file can be limited.

Passwords

If the network manager has specified a password for a directory, you must include the password on the **NET USE** command line. Your network manager will provide a list of passwords you are authorized to use for restricted directories.

For example, if a directory on the server **CENTRAL**, known by the alias "**ARIEL**" is protected by the password "**POOBAH**", you must type:

NET USE F: **\\CENTRAL\ARIEL** **POOBAH**

to connect the directory to your workstation's drive **F:**.

If you do not enter a password when one is required, or misspell the password, you will see the following message:

Invalid shortname or password

Directory Access Restrictions

Net/One PC System allows your network manager to restrict the kinds of operations you can perform on the files in a directory. The restriction is placed on a directory as a whole, and applies to any files already in the directory, and files that may be added later. The network manager can individually grant workstations permission to:

Read: files in the directory can be read; they can be read in by applications, and copied and displayed from the DOS prompt.

Write: files in the directory can be written into (or written over).

Create: new files can be created, and existing files can be deleted.

These permissions can be granted in combination:

R W C Access allowed:

- ■ ■ Unlimited access to files.
- ■ . Files may be read, and new data may be written into them (also, a file may be completely replaced by new data). File names cannot be deleted from the directory, and new file names cannot be created.
- . . files may be read, but new data cannot be written into them, and they cannot be deleted. New files may not be added to a "read-only" directory.

If you list a server's offers using the remote server **STATUS** or **SHARE** commands (as described in Chapter 9) you will see that each directory offered has an associated list of permissions. "RWC" in the permission column means unlimited access; "RW-" permission means read and write (but no create) access; and "R--" permission means read-only access.

Combined Permissions and Passwords

Remember that aliases can overlap, and that two different aliases could be used to describe the same directory. Sometimes your network manager will set up a directory offer so that workstation users can access it two different ways. One alias for the directory, without a password, might allow just read-only access.

Another alias, requiring a password, might allow unlimited read/write/create access. Thus only the users who know the password can write new data or create new files.

Your network manager will let you know about any restrictions that apply to directories.

SHARED FILES

Occasionally two workstations will attempt to access the same file on a server at the same time. When this happens one workstation will be successful (usually the first one to try), and the other will see the following message:

Error reading disk
Abort, Retry, Ignore?

Eventually the first workstation will be finished with the file. It's your option whether you keep trying by pressing **I**, or abort by pressing **A**.

RUNNING APPLICATION PROGRAMS

Running Programs Stored on a Server

When you establish a connection between a local workstation drive and a directory on a server you can treat the files on the server's directory just as if they were on a local drive. This includes programs stored on a server directory; once you establish a connection with **NET USE**, you can run that program from the drive you connected just like any other drive.

Running Workstation Programs with Server Data Files

You can use a data file stored on a server with most application programs that run under DOS. Any program which lets you specify the drive on which the data files are located can be used, simply by specifying the drive you linked to a server with **NET USE**.

However, there are some applications which read and write only to files that are in specific drives. These programs assume, for example, that your data files will always be in drive **B:**, or that they will always be in a particular directory.

You can solve the problem of an assumed drive by using the DOS **ASSIGN** command to "map" the drive connected to the server to the drive assumed by the program. The problem of an assumed directory can be solved with DOS's **APPEND** command, which tells DOS where to look for data files requested by an application if DOS can't find them in the current directory. Both commands are explained in Chapter 6.

INTRODUCTION

Many DOS commands are concerned with disk drives and files on them. This chapter describes two commands which are very useful in the Net/One PC System environment: DOS's **APPEND** and **ASSIGN** commands. It also lists several DOS commands which cannot be used on remote disk drives (those on a server).

RESTRICTED DOS COMMANDS

After you have used the **NET USE** command to connect to a network resource, you can use **almost** any DOS command with the remote files, directories, and printers. The exceptions are commands that read and write directly to the disk, as listed in Table 6-1. Note that you can still use these commands with your local disk drives.

(For the technically inclined: the commands you can't use all deal with the underlying structure of a disk; **FORMAT** is a good example. Redirecting a local disk drive to the network only simulates a disk drive, but the details of its real structure are hidden behind the Net/One PC System software. The equivalents for two of the commands--**COMP** for **DISKCOMP**, and **COPY** for **DISKCOPY**--work with individual files rather than entire disks).

If you try to use any of these commands with a remote file, directory, or disk you will see the message:

Cannot <command> a SUBSTed drive

where <command> is the name of the command you tried to use.

You can use DOS commands to list directories and to copy, look at, rename, and delete files. If you have connected a local disk drive to the network, just use that drive name in the command.

You can learn more about DOS commands from the *DOS User's Guide* and the *DOS Reference*. The following examples show you how to look at and copy remote files.

Examples

After connecting to the network, you can use the DOS **TYPE** command to look at a remote file the same way you look at a file on a disk in your own disk drive. For example, if you have connected drive **D:** to the remote directory **ACCOUNTS**, and you want to look at the remote file **OCT85** in the remote directory **ACCOUNTSPAYABLE**, type:

TYPE D:\PAYABLE\OCT85

You can use the DOS **COPY** command to copy a remote file onto a disk in your disk drive. If you have connected drive **D:** to the remote directory **ACCOUNTS**, you can use the following command to copy the remote file **\ACCOUNTSPAYABLE\OCT85** onto the disk in drive **A:**

COPY D:\PAYABLE\OCT85 A:

Table 6-1
Restricted DOS Commands

You cannot use...	Use instead...
CHKDSK	--
DISKCOMP	COMP
DISKCOPY	COPY
FDISK	--
FORMAT	--
JOIN	--
LABEL	--
PRINT	--
RECOVER	--
SUBST	--
SYS	--
VERIFY	--
-- indicates there is no equivalent command	

ACCESSING FILES IN OTHER DIRECTORIES: THE APPEND COMMAND

You may be familiar with the DOS **PATH** command that tells DOS to search the named directories for external command files. The **PATH** command works with files that have the **.EXE**, **.COM**, or **.BAT** filename extensions.

The **APPEND** command has a similar function, performed on data files (any file which isn't a runnable program). Use **APPEND** to access a file that is outside the current directory and that has an extension other than **.EXE**, **.COM**, or **.BAT**. Once you specify the pathname(s) with the **APPEND** command, you can use a file without moving to the directory where it is located.

When DOS searches for a file, it first searches the current directory or the directory that was specified, if any. It then searches directories indicated by the current **APPEND** command.

APPEND has three forms, as shown in Table 6-2. The first form shown is used to set one or more search paths. The second form displays currently appended directories; in other words, the results of a previous **APPEND** command. The last form shown cancels a previous **APPEND** without specifying a new append search path.

Typing an **APPEND** command replaces the previous **APPEND**. Using **APPEND** adds about 2.5k bytes to the amount of memory in your computer used by DOS. If you are using the DOS **ASSIGN** command (as explained later in this chapter), you must type the **APPEND** command **before** the **ASSIGN** command. You will probably want to put **PATH**, **ASSIGN**, and **APPEND** commands in your **AUTOEXEC.BAT** file.

Example

Assume you have several customer files in subdirectory `\ACCOUNTS\CURRENT` on a floppy disk in your drive **A:**. You want to edit those files with a word processing program that is in a directory `\TOOLS\EDITORS` on a network drive **D:**. In this example, we assume that the word processing program includes the files with both `.EXE` and `.FIL` extensions.

Table 6-2
The **APPEND** Command

SYNTAX 1

To define a search path for data files:

APPEND [`<drive>:`]`<pathname>` [`;` [`<drive>:`]`<pathname>`]`;`...]`[Enter]`

`<drive>:``<pathname>`

The drive plus pathname of the directory containing the file you want to use. You can specify multiple search paths by separating each path with a semicolon (`;`); do not exceed 128 characters in the line.

SYNTAX 2

To display the list of appended directories:

APPEND`[Enter]`

SYNTAX 3

*To cancel the previous **APPEND** command without specifying other directories to be searched:*

APPEND `;``[Enter]`

To set the search path for files with the *.EXE* extension, you must include the following in the **PATH** command:

PATH D:\TOOLS\EDITORS Enter

To access files with the *.FIL* extension located in the **\TOOLS\EDITORS** directory, you also need to use the **APPEND** command:

APPEND D:\TOOLS\EDITORS Enter

Now you can run the word processing program from your **\ACCOUNTS\CURRENT** directory on drive **A:** to edit your document files. When you type the command to call up the word processing program, the **\TOOLS\EDITORS** directory on drive **D:** will be searched automatically for the appropriate files.

THE ASSIGN COMMAND

DOS's **ASSIGN** command allows you "fool" an application program that insists on using a specific drive into using another drive. You simply assign the drive letter the application expects to the drive you want it to use. The **ASSIGN** command has the form:

ASSIGN <x>=<y> Enter

where <x> is the drive required by the application, and <y> is the drive you are actually using.

Example

If you are using an application that performs operations only to files in drive **B:**, but the file you want to use is in a remote directory connected to drive **D:**, type:

ASSIGN B=D Enter

This command takes all reads and writes destined for drive **B:** and sends them to drive **D:**.

7 YOUR WORKSTATION'S AUTOEXEC BAT FILE

INTRODUCTION

This chapter describes how to put Net/One PC System and DOS commands into a special batch file, *AUTOEXEC.BAT*, so that they automatically execute every time you start up your computer. The commands which execute automatically can be used to configure your workstation, and to automatically make network connections for you.

The root directory of your workstation's boot disk will contain an *AUTOEXEC.BAT* file, put there (or modified) by your network manager so that it contains the basic commands to start up your network interface adapter. After you have started using Net/One PC System you will find it useful to put your commonly-used network commands in *AUTOEXEC.BAT*.

Topics covered in this chapter:

- The *AUTOEXEC.BAT* file
- Editing the *AUTOEXEC.BAT* file
- Network startup commands
- Adding **NET USE** commands
- Adding **DOS PATH**, **APPEND**, and **ASSIGN** commands

THE AUTOEXEC.BAT FILE

DOS is set up to look for a special file, called **AUTOEXEC.BAT**, every time you start your computer (by turning it on, or rebooting). If the disk that DOS starts from contains this file in its root directory, DOS will execute a list of commands stored in **AUTOEXEC.BAT**. For example, if your disk had an **AUTOEXEC.BAT** file containing these lines:

```
DATE
TIME
PROMPT $p$g
ECHO Welcome to my workstation!
```

each time you booted your computer, you would be asked to enter the date and time; the system prompt would be set to display the disk and directory you're in; and the message "Welcome to my workstation" would be displayed.

In general, an **AUTOEXEC.BAT** file (or any batch file, for that matter) can contain any command you could type in yourself. This gives you a way of automatically making the network connections you want to use all the time, each time your computer starts up.

NETWORK STARTUP COMMANDS

The minimal *AUTOEXEC.BAT* file required to work with Net/One PC System will contain one command line to start up the network: **NET START**, with command line arguments to specify the network adapter software Net/One PC System will use, and the network name of your workstation. For example:

NET START URDR ALLEY.OOP

You probably will also find the command **NET NAME** in your *AUTOEXEC.BAT* file. This command displays the network name of your computer; for example:

```
C>NET NAMEEnter
```

Name	Type
MILO.BLOOM	COMPUTER NAME

Command completed successfully

EDITING YOUR AUTOEXEC.BAT FILE

First, check to see whether an *AUTOEXEC.BAT* file is already on your boot disk (your hard disk, root directory; or the boot diskette given to you by your network manager). If you already have one, you can add command lines to it. If you don't have one, you can start from scratch with an editor (although it's highly unlikely that you don't have one, since the network interface adapter and Net/One PC System are difficult to start up any other way).

You will need to use an editor which can work with "ASCII" files. This means that the editor works only on standard characters, and does not add any special control characters for formatting. Here are four examples (there are many other suitable editors):

Microsoft Word

If you read in an existing *AUTOEXEC.BAT* file, Word will automatically adjust itself to ASCII operation. If you are creating a new file, be sure to save the document "unformatted". That is, when you type **[Esc]-T-S**, answer "NO" to the question "Formatted?".

MicroPro's WordStar

Edit the document using WordStar's "N" (non-document) mode.

DOS's EDLIN

DOS includes a simple line editor which works only in ASCII mode. It was intended for very simple editing jobs like this. Consult your *DOS Reference* for information on using EDLIN.

Typing into a file

As a last resort DOS allows you to type characters directly into a file.

If you don't already have an AUTOEXEC.BAT file, use the following command. Use caution, since this command erases any previous file of the same name. At the DOS prompt type:

COPY CON: AUTOEXEC.BAT

If you wish to add lines to the end of an existing AUTOEXEC.BAT file, use the following command. Note that you can only add lines to the end of a file this way; you need a real editor to add lines to the middle of a file. At the DOS prompt type:

COPY AUTOEXEC.BAT+CON: AUTOEXEC.BAT

After starting the simple command line editor, type the lines into your file, then type **Ctrl Z** or **F6** , then **Enter** to close the file.

ADDING NET USE COMMANDS TO AN AUTOEXEC.BAT FILE

You can put **NET USE** commands in your *AUTOEXEC.BAT* file to automatically make network connections when your computer is turned on or rebooted. To put a **NET USE** command into the *AUTOEXEC.BAT* file, follow these steps:

- (1) Use a text editor to access the *AUTOEXEC.BAT* file on your DOS disk.
- (2) Type the **NET USE** commands as the last lines in the file. The **NET USE** commands must come after the network startup command (which appears in the file as the line **NET START**).
- (3) Save the *AUTOEXEC.BAT* file.
- (4) Restart DOS; the commands in the *AUTOEXEC.BAT* file will not take effect until the computer is rebooted.

The **NET USE** commands you put in an *AUTOEXEC.BAT* file are almost the same as you would have typed at the keyboard, with the exception of how you handle passwords. The form of the **NET USE** command is:

NET USE <device>: \\<computename> \<shortname> [*]

The options are the same, except for the final asterisk ([*]). It takes the place of a password that may be associated with the resource.

NOTE

In some cases, you may wish to connect automatically to a directory that requires a password. Do not type the password in your AUTOEXEC.BAT file. Anyone can look at this file and learn the password to a protected directory. Instead, type an asterisk (*) where the password would normally appear in the command line. When you use an asterisk, the server will prompt you for the password.

Refer to Chapter 3, 4, and 5 for detailed information about **NET USE**.

DOS PATH SEARCH CONTROL COMMANDS

After you've been using Net/One PC System for a while you probably find you're using programs and data in certain directories pretty regularly. It is convenient to tell DOS where to look automatically for these files (this is called a *search path*). Also, it's sometimes necessary to set search paths to help a program find its data files. These tasks are accomplished with DOS's **PATH**, **APPEND**, and **ASSIGN** commands.

PATH is very convenient for setting up automatic directory searches for programs you use often (it works only on programs), including non-network programs. You'll probably want to include your hard disk's root directory, the directory holding your DOS files, and the directory holding the Net/One PC System software, in the automatic search path. For example:

```
PATH=C:\;C:\DOS;C:\NETWORK
```

APPEND performs a function similar to **PATH** for data files. **ASSIGN** substitutes one disk drive letter for another. Chapter 6 covered the use of **APPEND** and **ASSIGN** in detail.

GENERAL AUTOEXEC.BAT EXAMPLE

The minimal *AUTOEXEC.BAT* file installed on your system as a result of the Net/One PC System installation process will look something like this:

```
ECHO OFF
PROMPT $p$g
DATE
TIME
CD \NETWORK
NET START URDR OPUS.BLOOM
```

The first four lines are standard DOS batch file commands: turn off command echo, set the DOS prompt to display the drive and directory you're in, and prompt you to set the date and time. The last two lines start up the network. Your **NET START** line may have different parameters than those shown.

In your everyday work you use files and a printer on your department's server, **DEPTSERV**. The server's disk has a structure like the example shown in Figure 5-1 on page 5-3. The printer has the alias **LETRQUAL**. Add the following **NET USE** commands to your *AUTOEXEC.BAT* file to automatically connect to the resources on **DEPTSERV**:

```
NET USE W: \\DEPTSERV\WORDPROC
NET USE M: \\DEPTSERV\MAIL
NET USE D: \\DEPTSERV\DATABASE
NET USE E: \\DEPTSERV\ACCTS.PAY *
NET USE LPT1: \\DEPTSERV\LETRQUAL
```

Note the use of the asterisk (*) after the **NET USE E:** command; this directory requires a password, and the asterisk tells Net/One PC System to prompt you to enter at the time the *AUTOEXEC.BAT* file is executed. As you type, the characters are not echoed to the screen, to keep the password confidential.

The **WORDPROC**, **MAIL**, and **DATABASE** offers contain programs you will want to use while you are working in other directories. Use the **PATH** command to tell DOS to search the drives you redirected to those offers to find the programs:

PATH=C:\;C:\NETWORK;C:\DOS;W;;M;;D:

The offer **ACCT.PAY** contains data files, and the word processing program in **WORDPROC** uses configuration files (which are the same thing as data files, as far as DOS is concerned). In order for DOS to find them like it finds programs, use the following **APPEND** command:

APPEND=W;;E:

When you are all done, you should end up with an **AUTOEXEC.BAT** file that looks like this:

```
ECHO OFF
PROMPT $p$g
DATE
TIME
CD \NETWORK
NET START URDR OPUS.BLOOM
NET USE W: \\DEPTSERV\WORDPROC
NET USE M: \\DEPTSERV\MAIL
NET USE D: \\DEPTSERV\DATABASE
NET USE E: \\DEPTSERV\ACCTS.PAY *
NET USE LPT1: \\DEPTSERV\LETRQUAL
PATH=C:\;C:\NETWORK;C:\DOS;W;;M;;D:
APPEND=W;;E:
```


REMOTE SERVER COMMANDS

INTRODUCTION

The **NET SERVER** command allows you to connect to a server and give it commands just as if you were typing on the server's own keyboard. It lets you display a summary of the server's status, list its available resources, and check the status of the server's printers and print queue.

There are additional server commands which won't be available to you unless you have a password; these commands are usually restricted to the network manager. Consult your network manager for more information.

LOGGING ON TO A SERVER

At the DOS prompt type:

NET SERVER <name> [<password>]

where <name> is the network name of the server, and [<password>] is the server password given to you by the network manager (you can omit the password, and be able to use a limited set of commands). You will see the following prompt:

Server:

You can now enter server commands. The commands you can use depend on whether or not you entered a password when you entered the **NET SERVER** command, as shown in Table 8-1. Without a password you can get only status displays. With a password you have access to all server commands except **PASSWORD** and **STOP**. Use either **EXIT** or **QUIT** to return to DOS.

NOTE

When issuing server commands at the **Server:** prompt the DOS command-line edit keys (**F1** - **F3**) do not work.

Table 8-1
Remote Server Command Access

Command	w/o password	with password
EXIT	all	all
FILE	all	all
HELP	all	all
PRINT	status	all
QUIT	all	all
SEPARATOR	none	all
SHARE	status	all
STATUS	all	all

GETTING A LIST OF OFFERS FROM A SERVER

One of the most useful things you can do after you've logged onto a server is call up a display of the offers available on that server. The list of server resources can be very useful to you, because it tells you what directories and printers are available to you from a given server using **NET USE**.

The server's **SHARE** command gives you this information. At the Server: prompt type:

Server: **SHARE /O**

Note the **/O** in the command. This command line switch turns off the display of the names of the users connected to each offer, and provides a more readable display. The server will display a screen something like this:

Shared Resources:			
Access/ Status	Network Name	DOS Name	Names Using Device
RWC	PAYABLE	ACCTS\PAYBLE\	
R-	WP	APPS\WORD	
RWC	EMAIL	APPS\HIGGINS	
***	PRINTER	PRN	
***	LASER	COM1	

The columns in this display list:

Access/Status	Shows which <i>permissions</i> are granted for that directory; permissions control whether you can read files in a directory (R); write files (W); and create new files (C). If the offered resource is a printer, this column contains three asterisks (***).
Network Name	Gives the alias for that directory. This is the name which follows the server name in a NET USE command.
DOS Name	Gives the drive specification and path name for that directory. This information just explains where on the server the resource is located; you needn't be concerned with it.
Names Using Device	Lists the names of work stations currently connected to the resource. Since you usually use SHARE with the /O switch, this column is shown empty.

The example shows that you can connect to three directories and two printers on the server named **MARCEL**. Two of the directories--known by their aliases **PAYABLE** and **EMAIL**--show "RWC" in the "Access/Status" column. This means you have unrestricted access to those directories. The directory made available as **WP** has R-- permission; this means that you can only read the files in this directory; you cannot write files or create new ones.

DISPLAYING PRINTER STATUS

The remote server command **PRINT** (with no command line arguments) will provide a display of the status of each printer attached to a server, and will provide a display of the files in the print queue. At the Server: prompt type:

Server: **PRINT** **Enter**

A list similar to the following will be displayed:

Printer LPT1

Printer is on
Printer is idle
Print separator is off

Printer COM1

Printer is on
Printer is busy
Print separator is off

PQ009	(COM1)	(MARTHA)	33144 Revised Price list 6/8/86 to all
PQ010	(COM1)	(BART)	11001 MEMO: distribution FROM

This example shows the status of two printers, connected to the server's **LPT1:** and **COM1:** ports. Both printers are on (that is, they are online and capable of receiving data). The printer attached to **LPT1:** is busy, while the other printer is idle, and not printing. The print separator function is off for both printers; this means that a separator page, showing the name of the print queue file, will not be printed before each print job.

The bottom of the display also lists two print spool files. This part of the display shows the names the server assigned to the files ("PQ009" and "PQ010"), the printer they will use ("COM1"), the network names of the workstations which sent them ("MARTHA" and "BART"), the size of each file in bytes, and the first few characters in the file. This part of the display shows the existence of the print spool files; the display version of the **NET PRINT** command, described below, provides a bit more useful information.

APPENDIX A

COMMAND REFERENCE

INTRODUCTION

This appendix provides a reference to the various Net/One PC workstation commands. Table A-1 is a summary of these commands.

Table A-1
Net/One PC Workstation Commands

APPEND	A DOS transient program to set the search path for data files.
NET CONTINUE	Restarts disk or print redirection after it has been suspended with NET PAUSE .
NET HELP	Displays help information.
NET NAME	Displays the network name of the workstation.
NET PAUSE	Suspends disk or print redirection.
NET PRINT	Sends a file to a network printer.
NET START	Starts the network interface adapter.
NET USE	Redirects a local device to a disk or printer on a server.
NET SERVER	Logs on to a server, allowing you to issue commands to the server from a workstation.
NET VER	Displays the version number of the software.

Each command starts with a formal reference entry:

command name

SYNTAX

formal command syntax definition; how you type the command, what the options are, etc.

DESCRIPTION

description of command's action/effect

EXAMPLE

examples of the command in use

REFERENCES

listing of the chapter(s) where a full discussion of the command can be found; cross reference to other commands affecting this one or related to it.

APPEND

SYNTAX

To define a search path for data files:

APPEND [<drive>:]<pathname>[:[<drive>:]<pathname>][:...]**[Enter]**

<drive>:<pathname>

The drive plus pathname of the directory containing the file you want to use. You can specify multiple search paths by separating each path with a semicolon (;); do not exceed 128 characters in the line.

SYNTAX 2

To display the list of appended directories:

APPEND**[Enter]**

SYNTAX 3

To cancel the previous APPEND command without specifying other directories to be searched:

APPEND ;**[Enter]**

DESCRIPTION

APPEND is a DOS transient command (command stored in the form of a program on disk) which tells DOS where to look for a data file when it cannot find it in the current directory. Data files are non-program files (files that do not have the extensions **.EXE**, **.COM**, or **.BAT**). This is similar to the function that **PATH** performs to search for program files. **APPEND** is used to help an application program access a data file which is outside of its local directory.

You can specify more than one path to be searched by separating each pathname with a semicolon (;), as long as you don't exceed a total of 128 characters in the command line.

APPEND followed by a single semicolon cancels any search paths set up by a previous **APPEND** command. Typing **APPEND** alone, with no options, displays a list of any search paths currently in effect.

When you enter a new **APPEND** command, it replaces the previous **APPEND**.

If you are using the DOS **ASSIGN** command you must enter the **APPEND** command before **ASSIGN** (see Chapter 6).

EXAMPLE

Assume you have several text files in your subdirectory **\ACCOUNTS\CURRENT**, which is on your workstation's hard disk (**C:**). You want to edit those files with a word processing program, which is in directory **\TOOLS\EDITORS** on your network drive **E:**. The word processing program has a **.EXE** file extension, and also uses several configuration files with the extension **.INI**.

Use the following **PATH** command to instruct DOS where to look for the word processing program (the **.EXE** files):

PATH E:\TOOLS\EDITORS

Use the following **APPEND** command to instruct DOS where to find the **.INI** files when the word processing program asks for them:

APPEND E:\TOOLS\EDITORS

Now you can run the word processing program from your `\ACCOUNTS\CURRENT` directory to edit your document files. When you type the command to call up the word processing program, the `\TOOLS\EDITORS` directory on your drive **E:** will be searched automatically to locate the appropriate files.

REFERENCES

pages 6-4 through 6-6 (command usage)
page 7-7 (use in `AUTOEXEC.BAT`)

NET CONTINUE

SYNTAX

To resume disk redirection, type:

NET CONTINUE {DISK REDIRECTION}
{DRDR}

To resume print redirection, type:

NET CONTINUE {PRINT REDIRECTION}
{PRDR}

DESCRIPTION

NET CONTINUE restarts disk or print redirection after you have suspended it with **NET PAUSE**.

EXAMPLE

(see **NET PAUSE** for a complete series of examples)

REFERENCES

pages 3-8 through 3-10 (general usage)
page 4-10 (use with key).

NET HELP

SYNTAX**NET HELP** <command>

or

NET <command> **HELP**

or

NET HELP <command> is a *Net/One PC Workstation* command:**CONTINUE
PRINT****HELP
START****NAME
USE****PAUSE
SERVER**

DESCRIPTION

NET HELP displays a help file containing information about the specified network command. If you don't specify a command, you get a display of the available commands.

NET NAME

SYNTAX

NET NAME

DESCRIPTION

NET NAME Displays the network name of your workstation. This is the name by which your computer is known to other devices on the network.

EXAMPLE

NET NAME produces a screen display similar to the following:

C>**NET NAME**

Name

Type

MILO.BLOOM

COMPUTER NAME

Command completed successfully

REFERENCES

page 7-3 (use in *AUTOEXEC.BAT*)

NET PAUSE

SYNTAX

To suspend disk redirection, type:

NET PAUSE {DISK REDIRECTION}
{DRDR}

To suspend print redirection, type:

NET PAUSE {PRINT REDIRECTION}
{PRDR}

DESCRIPTION

NET PAUSE suspends the redirection of print or disk redirection; it affects **all** redirection of either type. This allows you to use the local device for another purpose. Redirection can be resumed using the **NET CONTINUE** command.

NET PAUSE has a temporary effect. It does not delete network names you specified with **NET USE**.

Disk Redirection

NET PAUSE DISK REDIRECTION (or **DRDR**) is primarily useful when you have redirected an existing (real) local disk drive to the network with **NET USE**. When you do this, the local drive is "covered up" by the remote server drive, and you cannot use it. **NET PAUSE** "uncovers" the local drive temporarily so that you can use it. Sometimes you have to do this when an application program insists on using a particular drive (drive **B:**, in many cases) for data files, and you wish to use a network drive.

Print Redirection

NET PAUSE PRINT REDIRECTION (or **PRDR**) is useful when you are alternating between a local and remote printer, both using the same local device name. This situation can occur with some applications which will only print to **LPT1**, and you need to use both a local and network printer (for drafts and final output, for example).

EXAMPLE

Let's assume you're using a stubborn graphics program on your local hard disk. It will only operate on data files in the **B:** drive, and will only print to **LPT1**. Your data files, however, are on the **CAD** server, under the alias **GRAPH**. Further, you would like to use a dot-matrix printer connected directly to your workstation (at **LPT1**;) for check printouts, and then use a networked laser printer for final output. The laser printer is connected to the **CADPOOL** server, offered under the alias **LASERZAP**.

First, configure your network connections as follows:

NET USE B: \\CAD\GRAPH

NET USE LPT1: \\CADPOOL\LASERZAP

Since you want to start out making check printouts, suspend the redirection of **LPT1**: to the network with the command:

NET PAUSE PRDR

The program's printer output will now go to your local dot matrix printer.

At some point using the program you remember you have to get a final printout of a drawing on a floppy diskette. Exit the graphics program, and use these commands to resume your connection to the network laser printer, and suspend your connection to the network drive so that you can read a diskette in drive B:

NET CONTINUE PRDR Enter

NET PAUSE DRDR Enter

You're now free to use your local **B:** drive, and to print on the network laser printer.

REFERENCES

pages 3-8 through 3-10 (general usage)

page 4-10 (use with PrtSc key).

NET PRINT

SYNTAX

To print a file on a network printer, type:

NET PRINT [<drive>:][<path>]<filename>space<device>Enter

To display the status of a server's print queue, type:

NET PRINT <server name>Enter

To display the status of the print queue for a particular print device, type:

NET PRINT <device>

Command line arguments:

[<drive>:][<path>]<filename>

The name of the file to print. The filename can include a drive and path specification.

<device> the name of a redirected print device.

<server name> the name of a server.

DESCRIPTION

NET PRINT is a multi-purpose network printer utility. You can use it to send a file to a network printer (including files on network drives to which you're connected), and to examine the print queue associated with a specific print device or on a specific server.

NET PRINT works only with network printers. If you specify a <device> which you have not previously redirected you will get the error message:

Device is not redirected

When you use **NET PRINT** to examine the print queue on a specific server, you can specify the name of any server which is on line. This feature is handy for locating a printer which is not busy. If **NET PRINT** can't find the server, you will see the error message:

Network path not found

If a print queue is empty, you will see the message:

Queue is empty

EXAMPLE

The following command sends the file *MEMO* to the remote printer connected to **LPT1**:

NET PRINT MEMO LPT1:

The **NET PRINT <server>** or **NET PRINT <device>** status commands call up a display similar to the following:

workstation sending file							current status of file
Pos	ID	Size	Date	Time	Name	Status	
001	240	22580	10/21/86	16:41	MARMADUKE	PRINTING	
002	242	372	10/21/86	16:41	GARFIELD		
003	245	12923	10/21/86	16:42	ODIE		

↑ order files will be printed (001 first)
 ↑ queue file name (e.g. "PQ245")
 ↑ file size in bytes
 ↑ date into queue
 ↑ time into queue

REFERENCES

- page 4-5 (use of command to print a file)
- page 4-8 (status display)

NET SERVER

SYNTAX

NET SERVER <server> [<password>] **[Enter]**

<server> is the network name of the server you wish to log on to.

<password> is an optional password which gives access to restricted server commands.

DESCRIPTION

NET SERVER allows you to log on to a server remotely, over the network. When you are connected to the server, it displays this prompt:

Server:

You can enter a variety of commands at this prompt. Certain commands are restricted, and require you to also enter a password when you give the command. Your network manager will give you the password if necessary. Table A-2 below lists the commands available with and without a password.

Table A-2
Remote Server Command Access

Command	w/o password	with password
EXIT	all	all
FILE	all	all
HELP	all	all
PRINT	status	all
QUIT	all	all
SEPARATOR	none	all
SHARE	status	all
STATUS	all	all

The **QUIT** and **EXIT** commands disconnect you from the server. **HELP** lists the available remote server commands. **STATUS** is an overview summary of what's going on with the server; it is very useful for finding out what offers are available from the server. **SHARE** provides similar information, and **PRINT** displays the status of the server's printers, and the files waiting in the print queue. These displays are discussed in Chapter 8.

The other commands, those requiring a password to use, are generally of interest only to the network manager. See your network manager if you'd like to use the complete set of commands.

REFERENCES

page 8-2 (logging on)
pages 8-3, 8-4 (list of offers with **SHARE**)
pages 8-5, 8-6 (printer status display)

Net/One PC System Manager's Guide (restricted commands)

NET START

SYNTAX

NET START <type> <network name> Enter

<type> selects a startup configuration appropriate for your network adapter and operating requirements (your network manager will usually select this). Valid choices are:

NRDR	3RDR	URDR	U2RDR
CRDR	C2RDR	C3RDR	
TRDR	T2RDR		
IRDR	I2RDR	I3RDR	

<network name> is the name by which your workstation will be known to the network. Usually just your name is sufficient (as long as it's unique)

DESCRIPTION

NET START is the command which loads software into your network adapter card and starts up your connection to the network. It is usually placed in your workstation's *AUTOEXEC.BAT* file.

The <type> parameter is a code which tells the network software what kind of network adapter card you have, and which software to load into it. Your network manager should have chosen the proper code for you; there is no circumstance which will require you to change it.

The <network name> is merely an identification for your workstation to the network. The only restriction is that it should be unique on your network; two "J.SMITH"s are not allowed. Your network manager will have chosen a unique name for you, so you should probably not change it.

NET USE

SYNTAX

To connect to a server directory:

NET USE <drive>: [space] \\<server>\<alias> [space] [<password>] [Enter]

To connect to a server printer:

NET USE <device> [space] \\<server>\<alias> [space] [<password>] [Enter]

To disconnect a server directory or printer:

NET USE <drive>: [space]/D [Enter]
 <device>

To display current connections:

NET USE <device> [Enter]

<drive>: The letter associated with a disk drive on a workstation (A: through Z:).

<device> The name of a printer device:
 LPT1: LPT2: LPT3: PRN:

<server> The network name of the server you wish to connect to.

<alias> The name by which the resource you are connecting to is known.

<password> An optional word required to gain access to the resource; see your network manager.

DESCRIPTION

NET USE establishes a connection between a local workstation device and a resource offered remotely on a server. **NET USE** is Net/One PC's redirection command; it causes a local workstation device, either a disk drive or printer device, to be redirected over the network to a server resource.

Disk Redirection

You can choose any drive letter from **A:** to **Z:** to be redirected to a server directory. It's preferable to use a drive letter which is not already assigned to an existing drive; however, there are circumstances where this is necessary (see Chapter 5, and discussion of the **NET PAUSE** command in this appendix). If you redirect an existing drive, that drive becomes unavailable.

Server resources consist of disk directories offered to the network for sharing with workstations. These offers are identified by an alias assigned by the network manager; an alias is simply a name.

Printer Redirection

You can redirect any one of four workstation print devices: **LPT1:**, **LPT2:**, **LPT3:**, or **PRN:**. Note that **PRN:** is another name for **LPT1:**; you cannot redirect both devices at the same time. The device does not necessarily have to be unused at the workstation; if a printer port with an attached printer is redirected, that port will become unavailable.

General Information

- The <device>: name (drive letter or printer device) must **always** be followed by a semicolon (;). If you leave it out you will get an error message.
- Each **[space]** in the command is significant; if you leave one out you will get an error message.
- The <name> of the server must **always** be preceded by two backslashes ("\\").
- The <device>: name used when connecting to a remote directory should be the name of an unused drive on your computer. For example, if your workstation has a one hard disk drive it will be named drive C; therefore, you can use any drive letter from D: through Z: for <device>.

You aren't forbidden from using the name of a drive which already exists on your computer; but if you do, the existing drive will be made unavailable, and the newly connected remote directory will take its place.

- The <device>: name used when connecting to a remote printer should also be the name of an unused printer device on your computer. However, since most application programs default to LPT1:, you should probably use it as your remote printer.
- Your network manager must provide you with a list of <name>s of available servers. You can't connect to a server unless you know its name.
- Your network manager will also provide you with a list of the aliases for each server. You can also find out for yourself what resources a server offers (as long as you know the name of the server) with a remote status display, as described in "Remote Server Commands" in Chapter 9.

Messages

Successful operation of the **NET USE** command will generate the message:

Command completed successfully

If you select a device which has already been redirected, you will see the message:

Drive in use

(Note that the above message applies to printers as well as drives).

If you make a mistake specifying the device ("LPT5:", or drive "2", for example), you will be given the message:

Invalid device

If you make a mistake in the alias (sometimes known as a "shortname") or password, you will see the all-purpose message:

Invalid shortname or password

Finally, if you specify a non-existent server, **NET USE** will respond with:

Connection refused

EXAMPLE

The following command connects a workstation's drive **D:** to the disk resource named **ACCOUNTS** on a server named **SALES**:

NET USE D: \\SALES\ACCOUNTS

The next command connects the workstation's **LPT1:** printer device to a laser printer named **LAZZER** on a server named **PRINTSHOP**:

NET USE LPT1: \\PRINTSHOP\LAZZER

After executing these two commands, using **NET USE** with no command line arguments will call up a display of current connections similar to this:

Status	Local Device	Network Name
	D:	\\finance\accounts
	E:	\\finance\orders
	LPT1	\\centralaser

Command completed successfully.

REFERENCES

pages 3-2 through 3-5 (general command usage)
page 3-6 (listing connections)
pages 3-7, 3-8 (disconnecting)
pages 4-3, 4-4 (printer connection)
pages 5-4 through 5-7 (connecting to a server)
page 5-8 (use with password)

APPENDIX B MESSAGES

Attempt to use local name

Explanation: You attempted to connect to a remote resource but incorrectly specified your computer's network name as the computername of the server.

Action: Try the command again using the computername of your work station.

Can't read transport status

Explanation: The transport layer cannot report a status.

Cannot disconnect from current drive

Explanation: You attempted to disconnect your current drive.

Action: Switch drives, and try the command again.

Command completed successfully

Explanation: This message appears each time a network command is issued and successfully completed.

Action: none required.

Command operands incorrect

Explanation: You have typed a network command that is incorrect. You have included too many operands or too few.

Action: Check the syntax of the command by typing **NET HELP**.

Command parameters incorrect

Explanation: You have mistyped a parameter for the command.

Action: Check the syntax of the command by typing **NET HELP**.

Connection refused

Explanation: You used an invalid password when trying to connect to a shared resource or you tried to connect to a resource that has not been shared.

Action: Ask your network manager for a list of shared resources and their passwords.

Device is not redirected

Explanation: You have specified a printer to which you are not connected.

Action: You must connect to a remote printer, using the **NET USE** command, before you can use the remote printer.

Drive in use

Explanation: You have specified a drive letter in the **NET USE** command that has already been used.

Action: Check the list of drives in use by typing **NET USE**.

Enter Password:

Explanation: You used an asterisk in a **NET USE** command to specify that the password should be typed in.

Action: Type in the password to continue operation.

Error writing to <filename>

Explanation: An error occurred while writing to the specified file. The print command will not complete successfully.

Action: Check the remote computer and retry the command.

File not found: <filename>

Explanation: The network command could not find the file required to complete the requested operation.

Action: Check that you have correctly created the required files.

File not found

Explanation: The file you requested to be printed was not found.

Action: Use the **DIR** command to verify that the file exists and that you have typed its name correctly.

Incorrect DOS version

Explanation: You are trying to install Net/One PC System with an inappropriate version of DOS.

Action: To install Net/One PC System, you must be running DOS version 3.1 or higher.

Incorrect number of operands

Explanation: There was no keyword specified in the command.

Action: Check the command syntax by typing **NET HELP**.

Invalid device

Explanation: You have mistyped a device name.

Action: Retype the command.

Invalid shortname or password

Explanation: You have mistyped the pathname or password.

Action: Ask your network manager for the list of shared resources and their passwords.

NET805: Resource no longer available

Explanation: A connection you made previously to a server is now no longer functional. Usually, this will happen if the server has stopped working or has been restarted; this invalidates any connections you made previously.

Action: Try to make your connections again. If this fails, report the problem to your network manager.

Network already started

Explanation: You tried to start the network after it already had been started.

Action: To restart, reboot the computer.

Network error

Explanation: An error was reported from the network. Your command cannot be completed.

Action: Consult your network manager.

Network not installed

Explanation: The installation check for the network has failed. You must have the appropriate hardware and software installed to run Net/One PC System.

Action: Reboot your computer to run through the network startup sequence again (if you don't want to reboot your system, you will have to locate the **NET START** command in your **AUTOEXEC.BAT** file, and type the command exactly as shown in the file). If this fails to start the network, consult your network manager.

Network not started

Explanation: You issued a command without first starting the network.

Action: Reboot your computer to run through the network startup sequence again (if you don't want to reboot your system, you will have to locate the **NET START** command in your **AUTOEXEC.BAT** file, and type the command exactly as shown in the file). If this fails to start the network, consult your network manager.

Network path not found

Explanation: The network path you used does not exist.

Action: Check the network path.

No entries in list

Explanation: This message is produced in response to typing **NET USE** with no parameters, if there are no current network connections. This is not necessarily an error message.

Action: none required.

Queue is empty

Explanation: This message is produced in response to typing **NET PRINT** with a device or server name (the form of the command used to display the status of a print queue), if there are no files waiting in the queue.

Action: None required.

Sharing violation.
Abort, Retry, Ignore?

Explanation: You are trying to access a file that another station is currently using. Some files can be used by more than one user at a time (these are said to be "multi-user" programs or files); others cannot ("single-user" applications).

Explanation: You can press **[R]** to try again to access the file. You might try several times, to try and catch the file as the other user relinquishes it. If you don't want to wait, press **[A]**(abort) and try again later. You might also talk to your network manager about multi-user versus single-user applications that you can use.

System error

Explanation: This message means that there has been some kind of network failure. For example, an installation check may have failed or an incorrect local name has been used with the **setname** command.

Action: Check with your network manager to be sure that your work station has been set up correctly.

Alias A name that represents a server resource (directory or printer) that is shared over the network. The alias is the name that the workstation user uses to connect to the resource with the **NET USE** command. In this way the user does not need to be concerned with where, physically, the resource is located on the server.

Example

If a user wants to connect to a word processing application that has the alias **WP** on a server named **MKTG**, the command would be

NET USE D: \\MKTG\WP Enter

ANSI.SYS

A display driver. It interprets standard escape sequences used by network commands into hardware-specific commands to control the IBM PC display.

Argument

A part of a DOS command line following the name of a command. Arguments give the command additional information, or controls the the selection of options, or supply data to the command. See also "Switch".

AUTOEXEC.BAT

A batch file that contains commands executed by DOS when a computer is booted. Net/One PC System uses an **AUTOEXEC.BAT** file with a **net start** command that starts up a workstation or server.

Boot To load software into a personal computer. Specifically, to load an operating system from a disk into the computer's memory, and run it.

Circuit

A communications path between two points on the network. Specifically, refer to "Virtual Circuit".

Connection

A connection is the link between a workstation and an individual resource on a server; the link is set up by the redirection program in the workstation. In the example of the **NET USE** command in the definition of "alias" above, the link established between the workstation's directory **D:** and the resource **MKTG** on the server is a connection.

Multiple connections are possible between a server and a single workstation; there is one connection for each server resource the workstation is accessing. Note the difference between a connection and a "session": a session is the sum of the connections linking a workstation and a server. (See also "Session").

Buffer A temporary storage place in a computer's memory.

CONFIG.SYS

A file that contains DOS commands that specify memory allocation.

Device "Device" is a DOS term that generally refers to a specific part of the personal computer, such as a disk drive or printer. DOS assigns each device a name. For example, disk drives have names like **A:** and **B:** Printers have names like **PRN:** and **LPT1:**.

Workstations can redirect certain DOS devices to server resources using the Net/One PC System redirector; this is done by the **NET USE** command when it establishes a connection. Redirected disk drives could have logical names **A: - Z:**. Redirected printers can be named **LPT1:** through **LPT3:**. The Connection Manager can be used to additionally redirect printers on the serial ports **COM1:** through **com3:**.

Ethernet

A baseband local area network specification developed jointly by Xerox Corporation, Intel Corporation, and Digital Equipment Corporation to interconnect computer equipment using coaxial cable and "transceivers". Formalized in IEEE standard 802.3.

Local A resource on the computer where commands are being entered. A local directory (or file) is a directory (or file) that resides on a local computer.

Local Area Network (LAN)

A network that is located in a localized geographical area (e.g., an office, building, complex of buildings, or campus), and whose communications technology provides a high-bandwidth, low-cost medium to which many nodes can be connected.

MSNET.INI

A file that contains network commands, which are interpreted through **NET.EXE**.

NETBIOS

Acronym for "NETwork Basic I/O System". The I/O system for networking developed by IBM and other industry leaders which provides a standard for the software interface between the hardware in a personal computer and application or operating system software.

LC (load characteristics) file

A file that contains the network name, address, and configuration information for a network interface adapter.

Network

A series of nodes connected by communications channels. In this document, "network" is often used as a generic term encompassing both Ethernet and Token Ring networks.

Network Address

Each computer on the network must have a unique address. The network address is the Ethernet or Token Ring serial number of the Personal NIU or Personal NIC.

Network ID

Each network has a number which identifies it, called the *network ID*. The network ID, combined with the network address (see below) of an individual workstation or server, yields a complete and unique Ethernet address. In this way data can be transferred between networks (through gateways, for example).

Network Interface Unit (NIU)[®]

The Ungermann-Bass trademarked name for its network interface controller. The specific versions designed to be installed in personal computers are called "Personal NIUs".

Network Manager

The person responsible for setting up and maintaining the network.

Network Name

A name of 15 characters or fewer that represents the machine address.

NMC-1 (Network Management Console, Model 1)

An IBM Personal Computer that provides the execution environment for Net/One network management software and utility programs and storage for software to be downloaded into Net/One components on the network.

Node A station on the network. In practical terms, a node is any device attached to the network through a network interface adapter, and with which another device can communicate.

Offer "Offer" is the act of making a server resource available to the network by sharing it. The shared resource is usually referred to simply as a "resource", although it sometimes is called an "offer".

Passwords

Passwords limit access to resources. They are assigned by the network manager. If the network manager designates a password when a directory is shared over the network, only users who know the password can access the files in that directory. Certain commands are also protected by passwords; for example, some of the options to the **server** command require a password before they can be used.

Pathname

A pathname is a unique name that identifies a file by its location in the file system. DOS uses the following general form to describe the path specifying a local file (a file which is physically located on a disk drive in the computer at which the pathname is typed). Note the use of a single backslash ("\") after <drivename> to denote the root of the directory tree.

[<drivename>:]\[<directory>]\<filename>

Net/One PC System uses a double backslash ("\\") to distinguish pathnames identifying remote files (files accessed over the network). The double backslash appears at the beginning of a remote pathname (where a local pathname would have a single backslash). The network name of the server on which a remote file is located follows immediately after the double backslash. The general form of a network pathname is:

\\<name>\<directory>\<filename>

Network pathnames are only used to set up a logical drive redirection. After redirection the network pathname is known by an alias, one of the drive letters A: through Z:. If you try to type a network pathname at the DOS prompt, you will get the error message:

Invalid directory

NIC The Ungermann-Bass Network Interface Controller for the IBM PC, XT, and AT.

Port The physical or logical access point to (or between) a computer or network. A physical port is a collection of signals and circuitry making an electrical connection. A logical port represents the capability to communicate across a physical port. The distinction becomes evident in situations in which several streams of data are multiplexed into a single electrical signal; there may be several logical ports available through a single physical port. For example, the Ungermann-Bass Connection Manager II (and some terminal emulators) can establish several independent and simultaneous connections to remote hosts; these programs are said to have available more than one logical port.

Record locking

Record locking allows non-overlapping byte ranges in an open file to be locked against access by other users. When a file is open for shared access, locked records can be modified only by the person who placed the lock, thus maintaining database integrity. Record locks are normally removed by the application program before it terminates; however if the network connection is unexpectedly broken (for example, when the work station machine is restarted), there may be a small delay before the locks are removed and the file closes automatically. The file closes as soon as the server realizes that the connection to the work station has failed.

Redirector

The redirector is the workstation software that enables a workstation to connect to server resources over the network. The redirector intercepts requests for specific resources--disk drives and printers--and determines whether the requested resource is located on the local computer, or whether the request for a service must be sent to a server. In this way the redirector makes the network invisible to the user; as far as the user is concerned there is no difference between local and remote files and printers.

Remote and Local

The terms "remote" and "local" refer to the location of resources from the viewpoint of the workstation. A resource is local if it's on the computer where commands are being entered; and remote if it's on the server. For example, a workstation may use a text editing program that resides on a diskette in its own drive to edit a file on a server. The text editor is local, while the file on the server is remote.

Resource

A resource is a server directory, file, or printer that has been *offered* to the network, and can be used by a program in a workstation. Resources are sometimes referred to as "offers".

Server A device, usually a personal computer, which provides services to workstations on the network. Services provided by servers include making directories and files, and printers, available to the network.

Session

When a workstation establishes a communication link to a specific server, a session is established (another name for a session is a "virtual circuit"). A session basically sets up an open conversation between two network entities, so that future communications can occur. Within that session, multiple connections may exist.

Share Make resources available to the network with specific password and permissions.

Shortname

Another name for an "alias".

Switch

An option to an DOS command. Switches give the command additional information. See also "Argument".

Terminal Emulator

Personal computer software which allows the user to interact with a host mainframe or minicomputer as if the personal computer were a terminal on the host.

Token Ring

A network architecture in which nodes are linked serially in a ring or "daisy chain" topology--the nodes receive messages and pass them along to the next node. Access to the network is controlled by possession of a "token". The operation of the token ring network has been formalized in IEEE standard 802.5.

Virtual Circuit

A logical communications path between two nodes on the network. A virtual circuit is established through the cooperation of the Net/One software at both ends of the virtual circuit. Once established, the virtual circuit functions like a physical circuit, from the viewpoint of an applications program.

Workstation

The personal computers linked to servers on the network are called workstations. Workstations also operate independently of the network when they run a local application program which doesn't access the network. Usually there are many workstations on one network.

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Writers: Thea Cain, Robert Shepherd

Illustrator: Robert Shepherd

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Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required, at his own expense, to take whatever measures may be required to correct the interference.

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INSTALLATION OVERVIEW

The purpose of this Guide is to provide all of the information necessary to enable you to install an Ungermann-Bass Net/One network adapter into your Personal Computer. This guide covers installation of:

- NIUpc
- 3270 NIUpc
- Personal NIU
- NIUpc/Token Ring
- NIC

(Appendix B also provides reference information on the Model 2561A Personal NIU/Token Ring, which is no longer manufactured).

THE INSTALLATION PROCESS

Familiarize yourself with the adapters

Chapter 1 covers the operational characteristics of each Ungermann-Bass network adapter.

Check your adapter's jumper settings

Chapter 2 covers the jumper locations and settings of each adapter. At a minimum you should verify that the jumpers are, in fact, set to their factory defaults. In certain situations you may need to change the jumpers to accommodate the other adapters in a particular personal computer. Chapter 2 identifies these jumpers, and Appendix A describes the corresponding changes you will have to make to the adapter software command lines.

Prepare for the installation

Chapter 3 provides information about the tools you may need to have on hand, preparing the personal computer for installation, and covers locating and recording the network address of the adapter.

Install the adapter and connect it to the network

There are three chapters in this Guide covering board installation and network connection; one for each type of network technology:

Baseband Ethernet installation is covered in Chapter 4.

Broadband Ethernet installation is covered in Chapter 5.

Token Ring installation is covered in Chapter 6.

Test the installation, troubleshoot if necessary

The testing process depends on the network software you will be using. The *Net/One* System Manager's Guide covers use of the Ungermann-Bass version of Microsoft Networks. The *BNS/PC Interface Manual* covers the use of the generic BNS/PC Interface software. If you have problems, Chapter 7 provides helpful troubleshooting hints.

Reference Information

In addition to the installation information described above, this Guide includes reference information in three appendixes:

Appendix A describes the command line options and parameters for the Net/One software associated with each adapter. If your installation requires you to change adapter jumpers, you must also change the associated software command lines.

Appendix B provides jumper and software command line information about the Personal NIU/Token Ring. This adapter is no longer manufactured, but this information is included here in case you have one of these adapters.

Appendix C contains an installation record form which you can copy, and which may prove useful for recording pertinent installation information.

1 YOUR NET/ONE NETWORK ADAPTERS

INTRODUCTION

Ungermann-Bass offers a comprehensive line of network adapters to support three networking technologies: baseband Ethernet; broadband Ethernet; and Token Ring. The product line is divided into three families: NIUpc; Personal NIU; and NIC ("NIU" stands for "Network Interface Unit"; and "NIC" stands for "Network Interface Card"). Tables 1-1 through 1-3 list the network adapters by network type, and act as a cross-reference for the discussion of the network adapter families which follows.

All of these network adapters give you access to all the resource and information sharing network services of your Net/One network, including access to mini-computers, mainframes, file servers, modems, and printers within your workgroup and throughout the corporate environment.

Table 1-1 Baseband Ethernet Network Adapters	
<i>NIUpc Family:</i> NIUpc 3270 NIUpc	PC2010 PC2030
<i>Personal NIU Family:</i> Personal NIU/Ethernet	2261A
<i>NIC Family:</i> NIC Baseband (external transceiver) NIC Baseband (internal transceiver)	2271A 2272A

Table 1-2
Broadband Ethernet Network Adapters

<i>NIUpc Family:</i>	
NIUpc	
(internal single-cable modem)	PC2011
(internal dual-cable modem)	PC2012
3270 NIUpc	
(internal single-cable modem)	PC2031
(internal dual-cable modem)	PC2032
<i>Personal NIU Family</i>	
Personal NIU/Ethernet Family	
(internal single cable modem)	2360A
(internal dual-cable modem)	2360B
(external single-cable modem)	2362A
(external dual-cable modem)	2362B
<i>NIC Family:</i>	
(internal single-cable modem)	2370A
(internal dual-cable modem)	2370B
(external single-cable modem)	2372A
(external dual-cable modem)	2372B

Table 1-3
Token Ring Network Adapters

<i>NIUpc Family:</i>	
NIUpc/Token Ring	PC2500

THE NIUpc FAMILY

The Network Interface Unit for personal computers (NIUpc) is a single circuit board that plugs directly into one expansion slot of an IBM PC, XT, or AT, and fully compatible computers. NIUpcs are available for baseband and broadband Ethernet, and for Token Ring.

There are two variations of the NIUpc:

The basic *NIUpc* gives you access to the resources and information sharing services of your Net/One network. With the NIUpc you can access resources in your workgroup and throughout the corporate environment, including file servers, print server, modems, minicomputers, mainframes, and high-speed bridges between locations. The NIUpc is supported by Microsoft Networks, Novell NetWare, and many other network applications.

The *3270 NIUpc* adds micro-to-mainframe communication capabilities to the standard Net/One capabilities of the NIUpc. It fully supports software which runs with the IBM 3278/79 Emulation Adapter, and provides full emulation of the DCA IRMA adapter.

Applications written for these devices communicate through the 3270 NIUpc, over the local network connection to an NIU-74, which is the Net/One interface to an IBM 3274 controller. This allows your workstation to make two IBM host connections and two asynchronous network connections, and simultaneously run a local PC workstation application.

The NIUpc has an onboard microprocessor, RAM, and ROM software, to relieve its host microcomputer of most of the processing burden of the network interface. It can provide an optimum number of concurrent network connections, so that you can make full use of the resources within your company without having to interrupt applications or reboot your PC.

The NIUpc features:

- 80186 microprocessor
- 82586 ethernet network co-processor
- 8 KB ROM diagnostics
- 256 KB shared RAM

The 3270 NIUpc includes additional features:

- IBM 3270 hardware compatibility
- IRMA coax card compatibility

Table 1-4 lists the members of the NIUpc Family.

Table 1-4 The NIUpc Family	
Model PC2010	NIUpc (baseband Ethernet)
Model PC2011	NIUpc (broadband Ethernet, with internal single-cable modem)
Model PC2012	NIUpc (broadband Ethernet, with internal dual-cable modem)
Model PC2030	3270 NIUpc (baseband Ethernet)
Model PC2031	3270 NIUpc (broadband Ethernet, with internal single-cable modem)
Model PC2032	3270 NIUpc (broadband Ethernet, with internal dual-cable modem)
Model PC2500	NIUpc/Token Ring

THE PERSONAL NIU FAMILY

Like the NIUpc, the Personal NIU is a full-slot network adapter that allows direct connection to Net/One resources, giving users the same basic networking capabilities as those of the NIUpc. Personal NIUs are available for baseband and broadband Ethernet. Personal NIUs are available with an internal broadband modem which plugs into a second slot in your PC; external broadband modems are also available. Table 1-5 lists the members of the Personal NIU Family.

Like the NIUpc, this network adapter incorporates components designed to off-load network processing from your PC's processor, for higher throughput on busy corporate networks. The Personal NIU onboard memory frees your personal computer's processor of networking tasks, allowing it to concentrate on running applications. Most of the network software resides on the network adapter itself, freeing PC memory.

- 80186 microprocessor
- 82586 ethernet network co-processor
- 8 KB ROM diagnostics
- 128 KB shared RAM.

Table 1-5
The Personal NIU Family

Model 2261A	baseband Ethernet; requires an external transceiver
Model 2360A	broadband Ethernet, with an internal modem for single-cable systems
Model 2360B	broadband Ethernet, with an internal modem for dual-cable systems
Model 2362A	broadband Ethernet, with an external modem for single-cable systems
Model 2362B	broadband Ethernet, with an external modem for dual-cable systems

THE NIC FAMILY

Like the NIUpcs, the NIC is a full-slot network adapter that allows direct connection to Net/One networks. NICs are available for baseband and broadband Ethernet. The baseband models also give you the option of having an onboard transceiver to simplify the network connection. Table 1-6 lists the members of the NIC Family.

The NIC features:

- Ethernet coprocessor
- 8 KB send buffer
- 16 KB receive buffer
- Optional onboard transceiver

The co-processor and large buffers allow faster throughput than other comparable network adapters on the market.

The NIC is designed for users who will need access to primarily work-group network resources, such as laser printers and applications on the server, rather than the simultaneous access to multiple departmental and corporate resources provided by the NIUpc products.

NOTE

The NIC is not supported for use in servers, or with the 3270 PC Workstation.

Table 1-6
The NIC Family

Model 2271A	baseband Ethernet; requires external transceiver
Model 2272A	baseband Ethernet; with an internal transceiver
Model 2370A	broadband Ethernet; with an internal single-cable modem
Model 2370B	broadband Ethernet; with an internal dual-cable modem
Model 2372A	broadband Ethernet; with an external single-cable modem
Model 2372B	broadband Ethernet; with an external dual-cable modem

OVERVIEW

Each network adapter uses jumper blocks on its circuit board to control the selection of various hardware options; jumper plugs short adjacent pairs of pins to program these options. Each adapter is shipped with a standard set of jumper options.

This chapter has two purposes: to identify the default jumper settings so that you can verify them before installation; and to identify the various jumpers in the event that you must change them. The need to change these settings may arise when a network adapter card interrupt, I/O address, or memory assignment conflicts with that used by another option card in the personal computer.

The jumper settings on most of the adapters control four options:

SHARED MEMORY WINDOW

The PC memory area from 640 Kbytes to 1 Mbyte is reserved for standard IBM and third party option boards. Network adapters use a "window" in this area to exchange blocks of data with the host microprocessor. The Personal NIU requires a 64 Kbyte window; the NIUpc, 3270 NIUpc, and NIC require a 32 Kbyte window. The jumper setting controls the beginning address of the window.

I/O ADDRESS

The network adapters use blocks of 8 I/O ports for programming and status information. The jumper controls the beginning I/O address.

INTERRUPT

Your personal computer has either 8 or 16 hardware interrupt settings. Hardware interrupts are what option cards use to get the personal computer's attention. Each network adapter requires one hardware interrupt.

HOST SYSTEM BUS

The PC and PC/XT expansion slots support an 8-bit data path; the AT provides a mixture of 8-bit and 16-bit slots. The NIUpc family of adapters have jumpers to select the bus interface.

The defaults for each Net/One network adapter are shown in Table 2-1.

The remainder of this chapter deals with each individual Net/One network adapter and its optional jumper settings, so that you can configure your Net/One board for a broad range of workstation and server configurations.

**Table 2-1
Network Adapter Default Settings**

Network Adapter	Memory	I/O	Interrupt
3270 NIUpc	D8000h	368h	2/3*
NIUpc	C8000h	368h	3
NIUpc/TR	D0000h	368h	2
Personal NIU	D0000h	360h	2
NIC	D0000h	n/a	2
* Interrupt 2 is used for IBM 3278/79 emulation functions. Standard network interrupt is 3.			

Before you begin reviewing the different jumper options for each network adapter, you may want to review the hardware requirements of each of the other adapters currently installed in your personal computer. This can generally be done by reviewing the manuals that come with each adapter. For more information, consult your network manager or the manufacturer of each adapter. Appendix A gives an overview of some popular PC hardware options that may conflict with the Net/One hardware.

NIUpc, 3270 NIUpc JUMPER SETTINGS

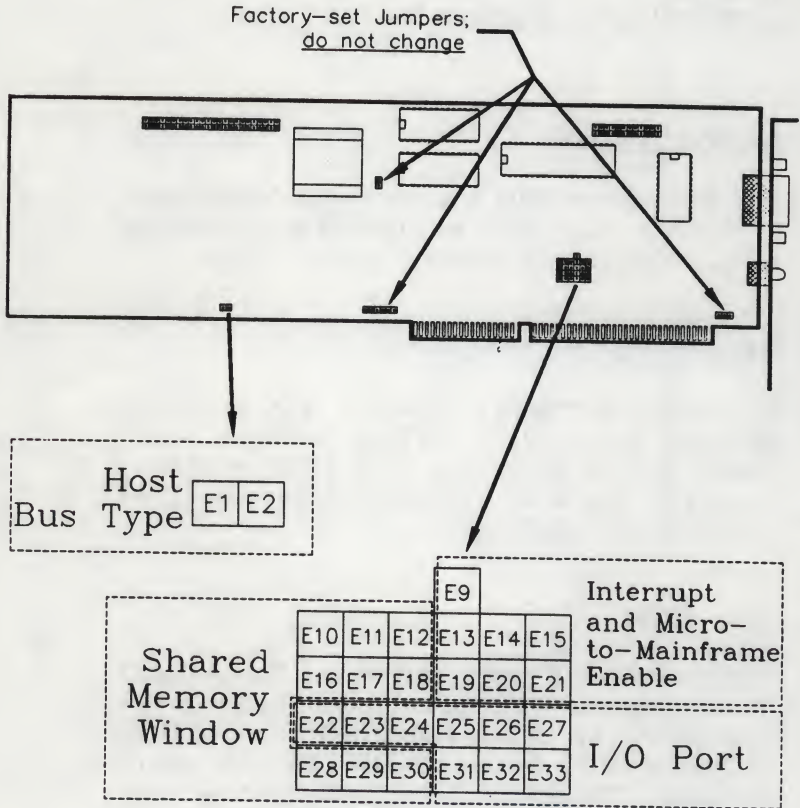
Your NIUpc has been configured at the factory for use in most common configurations of 8088-based PC or XT compatible computers. There are three sets of jumpers on the NIUpc and the 3270 NIUpc, labelled E1 through E38. Refer to Figure 2-1 for their locations, and Figure 2-2 for the jumper settings. The jumpers determine the following parameters:

- Host system bus (generally, 16-bit for ATs, 8-bit for XTs)
- Shared memory window starting address
- Port address range
- Interrupt channel, and use of micro-to-main-frame emulation

The jumper options are described in detail below.

Host System Bus Selection

Personal computers are available with 8-bit, 16-bit, and even 32-bit bus slots. Your NIUpc has been designed to work with either 8-bit or 16-bit slots; the small jumper block with pins E1 and E2 selects which type of slot you will be using. If the shunt plug is connected to either of the two pins and "hanging", (not connected to the second pin), the selection is for an 8-bit bus. Inserting the shunt plug so that E1 and E2 are connected enables the extended bus interface for 16-bit bus transfer between computer and NIUpc.



JUMPERS

NIUpc, 3270 NIUpc

Figure 2-1

I/O Port Address

The default I/O port address is 368-36Fh. It can be changed to 350-357h, 358-35Fh, or 360-367h. The jumpers to change are found on the bottom right side of the NIUpc main jumper block.

Interrupt Channel

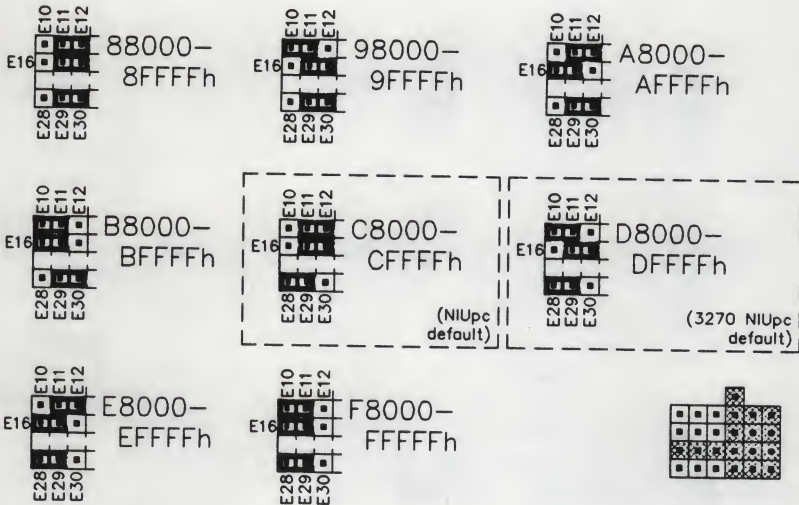
The interrupt channel jumpers on the NIUpc and 3270 NIUpc also enable and disable micro-to-mainframe emulation (if you have a 3270 NIUpc).

NIUpc

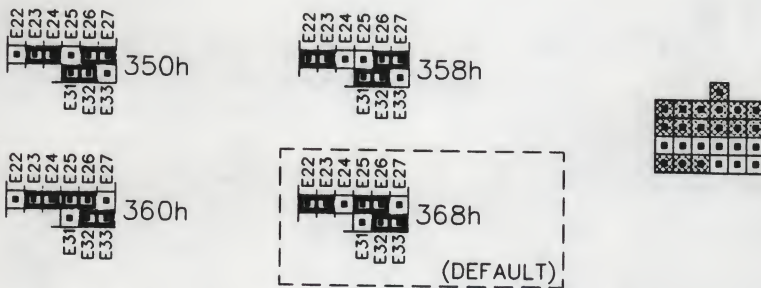
The default jumper setting selects IRQ3 as the interrupt used by the NIUpc network functions. The jumper may be changed to IRQ2, IRQ4, or IRQ5, if necessary. The micro-to-mainframe jumper, E13+E9, should be off (disabled).

3270 NIUpc

Jumpers E13+E19 enable/disable the 3270 NIUpc's micro-to-mainframe circuitry; installing the jumper enables it. This circuitry uses IRQ2, leaving IRQ3, IRQ4, and IRQ5, for the adapter's Net/One interface functions. The default jumper settings on a 3270 NIUpc enable micro-to-mainframe and select IRQ3 for the Net/One interface.



Shared Memory Window

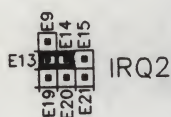


I/O Port

NIUpc, 3270 NIUpc
Jumper Settings

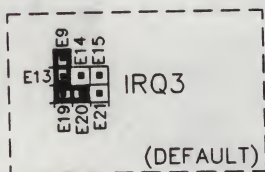
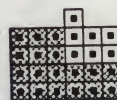
A

Figure 2-2A



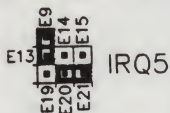
Interrupt

(micro-to-mainframe disabled)



Interrupt

(micro-to-mainframe enabled)



(NOTE: micro-to-mainframe uses IRQ2 when enabled)

□ □ PC, XT

■ ■ AT

Host
System Bus

NIUpc, 3270 NIUpc
Jumper Settings

B

Figure 2-2B

Shared Memory Window

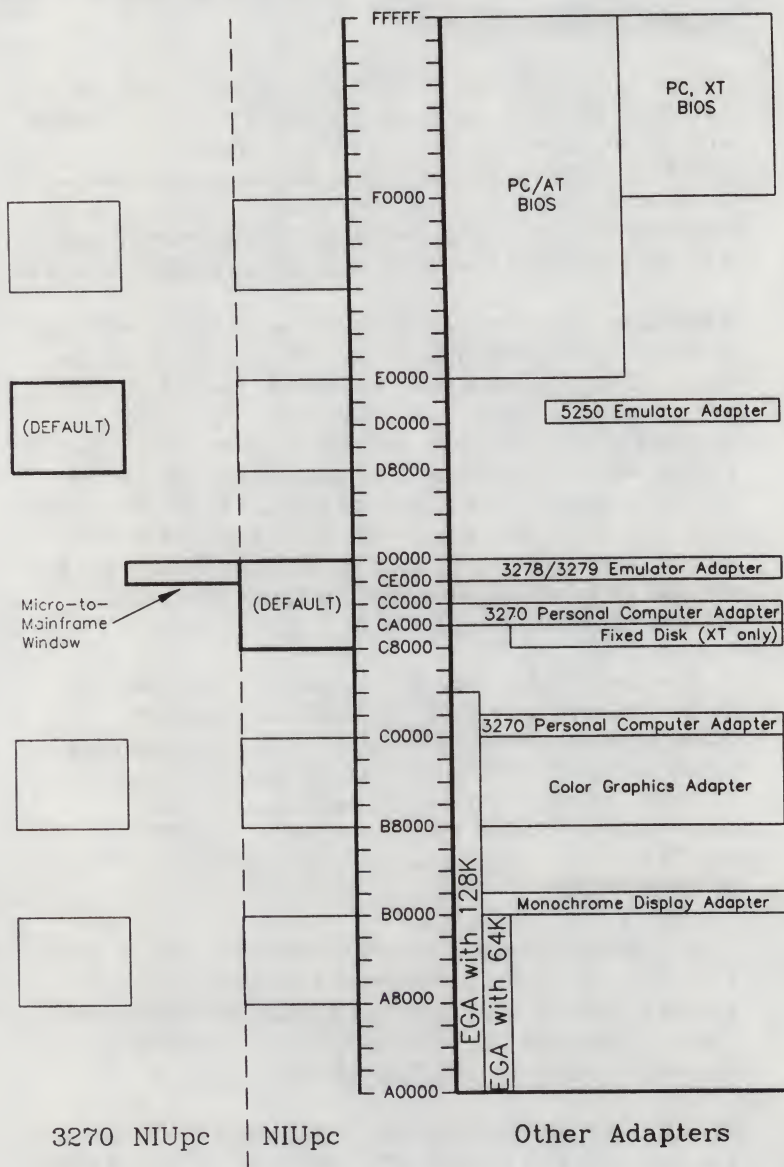
The memory window jumper settings allow the NIUpc and 3270 NIUpc to address the 512 Kbytes to 1 Mbyte area of processor memory, addresses 88000h to FFFFFh. The NIUpc uses a 32 Kbyte shared memory window within this range; the window falls on an "x8000h" boundary (for example, A8000h or 98000h). The default shared memory window is D8000-DFFFFh.

The shared memory window may be changed with the jumpers on the left side of the NIUpc's main jumper block. The available window option jumper settings are shown in Figure 2-2B. Note that the memory jumpers consist of three "triplets" (three jumper pins in a row, with the shorting plug connecting the center pin with the pin on the left or right). Most important, note that there is a gap in the middle of the triplets, where there is a triplet used by another function. **Be careful to avoid accidentally changing this middle jumper by mistake.**

If your personal computer has an expanded memory card conforming to the LIM/EMS specification ("Lotus-Intel-Microsoft/Expanded Memory Specification") you will have to change the shared memory window jumper. EMS cards, such as the Intel AboveBoardtm, use a memory window at D0000h. You'll have to choose another window for the NIUpc or 3270 NIUpc.

There are additional memory considerations for the 3270 NIUpc. It has a window at CE000h which is used by 3278/79 Emulation and DCA IRMA programs. Thus you cannot use window C8000h as a shared memory window on the 3270 NIUpc.

Figure 2-3 diagrams how the NIUpc and 3270 NIUpc use memory, and lists memory usage of several popular PC expansion cards.



NIUpc and 3270 NIUpc Memory Considerations

Figure 2-3

NIUpc/TOKEN RING JUMPER SETTINGS

There are four sets of jumpers on the Token Ring NIUpc, labeled E3-E4 and E14-E55, that you can change. Refer to Figure 2-4 for their locations, and Figure 2-5 for the jumper settings. The jumpers determine the following parameters.

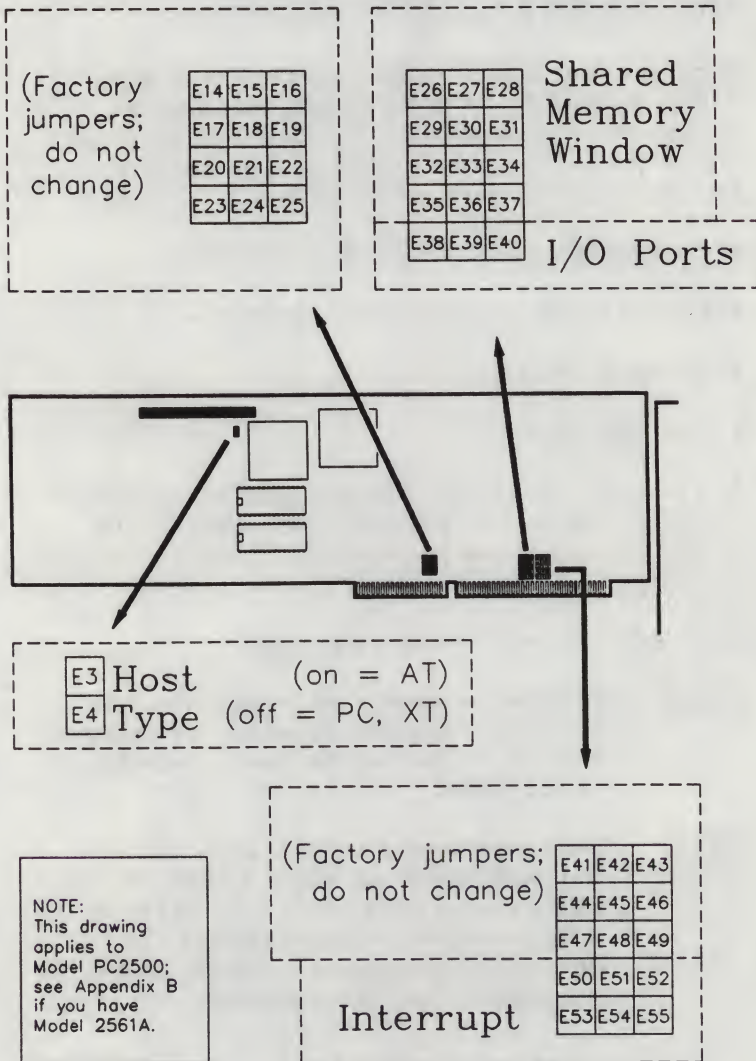
- Host System Bus selection (8- or 16-bit)
- Shared memory window starting address
- Port address range
- Interrupt channel

The primary setting that you will need to consider is the AT Bus selection. Generally, the other default jumper settings of the Token Ring NIUpc will handle the majority of installations.

Each option is described in detail below.

NOTE There are a number of jumpers that are factory set and do not need to be changed. Only those that can be changed are discussed below.

















NOTE The above jumper settings apply to the NIUpc/Token Ring, model number PC2500. There is also a "Personal NIU/Token Ring", which is no longer manufactured. If you have one of these, model number 2561A, see Appendix B for jumper settings.



JUMPERS

NIUpc/Token Ring

Figure 2-4

 E26 E28 E29 E31 E32 E34 E35 E37 80000- 87FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 88000- 8FFFFh
 E26 E28 E29 E31 E32 E34 E35 E37 90000- 97FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 98000- 9FFFFh
 E26 E28 E29 E31 E32 E34 E35 E37 A0000- A7FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 A8000- AFFFFh
 E26 E28 E29 E31 E32 E34 E35 E37 B0000- B7FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 B8000- BFFFFh
 E26 E28 E29 E31 E32 E34 E35 E37 C0000- C7FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 C8000- CFFFFh
<div style="border: 1px dashed black; padding: 5px; display: inline-block;">  E26 E28 E29 E31 E32 E34 E35 E37 D0000- D7FFFh (DEFAULT) </div>	 E26 E28 E29 E31 E32 E34 E35 E37 D8000- DFFFFh
 E26 E28 E29 E31 E32 E34 E35 E37 E0000- E7FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 E8000- EFFFFh
 E26 E28 E29 E31 E32 E34 E35 E37 F0000- F7FFFh	 E26 E28 E29 E31 E32 E34 E35 E37 F8000- FFFFFh

Shared Memory Window

NIUpc/Token Ring Jumper Settings

A

Figure 2-5A (1 of 2)



360-
367h



368-
36Fh

(DEFAULT)

I/O Port



PC, XT



AT

Host Type



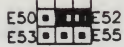
IRQ2

(DEFAULT)



IRQ3

Interrupt



IRQ4



IRQ5

NIUpc/Token Ring
Jumper Settings



Figure 2-5B (2 of 2)

Host System Bus Selection

The NIUpc/Token Ring can be installed in either a 16-bit or an 8-bit bus slot. If you have an AT or compatible, you will probably want to set the adapter for 16-bit bus operation. This is done by setting the jumper E3-E4 on. If you want to run 8-bit bus operation for a PC or XT, set this jumper off. The default setting is E3-E4 off.

NOTE

Some ATs have a very fast bus (faster than 8 Mhz) and may be incompatible with the Token Ring NIUpc's 16-bit bus. If this is the case, try the 8-bit bus, which has more room for speed tolerance.

Shared Memory Window

The Token Ring NIUpc requires a 32 Kbyte shared memory window. The default shared memory window is D0000-DFFFF. Jumpers E26 to E37 change the shared memory window.

The memory window jumper settings represent the window addresses 80000h to FFFFFh (512 Kbytes to 1 Mbyte). The recommended setting is D0000h to D7FFFh.

I/O Port Address

The default I/O port address is 368-36F. It can be changed to 360-367. The default jumper is installed on pins E38 and E39.

Interrupt Channel

The default interrupt channel is IRQ2. The jumper is installed on pins E20 and E21. If this conflicts with other hardware, IRQ3 through IRQ5 are available as an option.

PERSONAL NIU JUMPER SETTINGS

There are four sets of jumpers on the Personal NIU. Refer to Figure 2-6 for their locations, and Figure 2-7 for the jumper settings. The jumpers determine the following parameters.

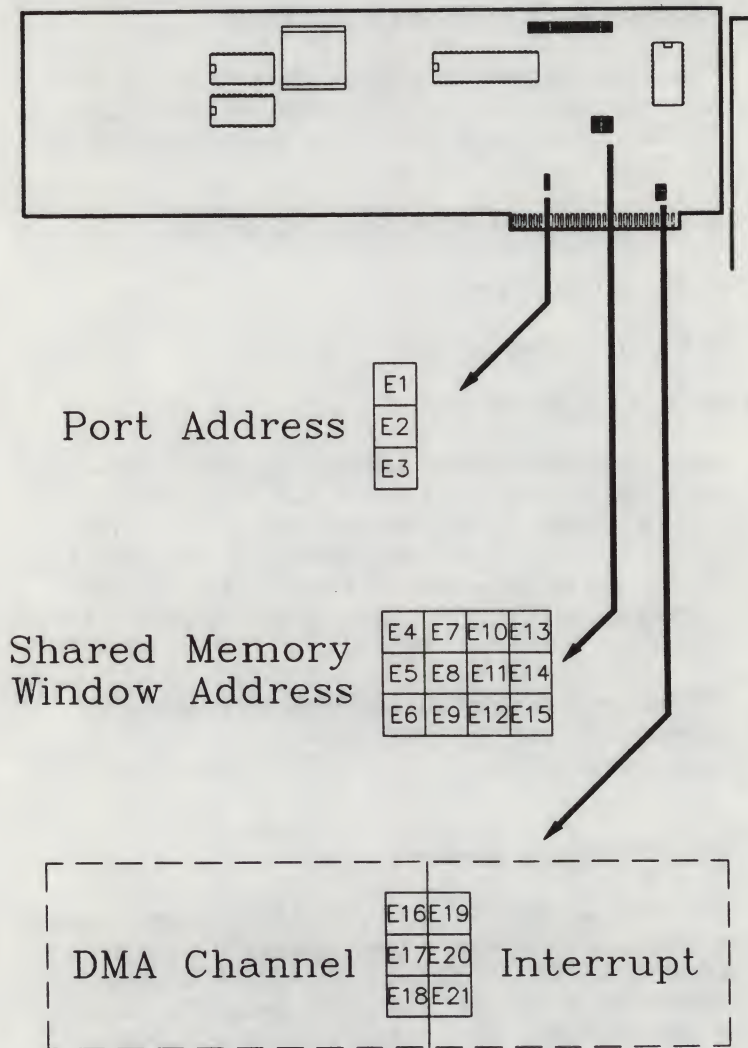
- Shared memory window starting address
- Port address range
- Interrupt channel
- DMA request channel

Only the first three are used with the Net/One software; the DMA channel is not used. Generally, the default jumper settings of the Personal NIU will handle the majority of installations. If you need to change any of these settings because of a possible hardware conflict, the jumper options described below will help.

The jumpers on the Personal NIU card, labeled E1 through E21, are described below.

Shared Memory Window

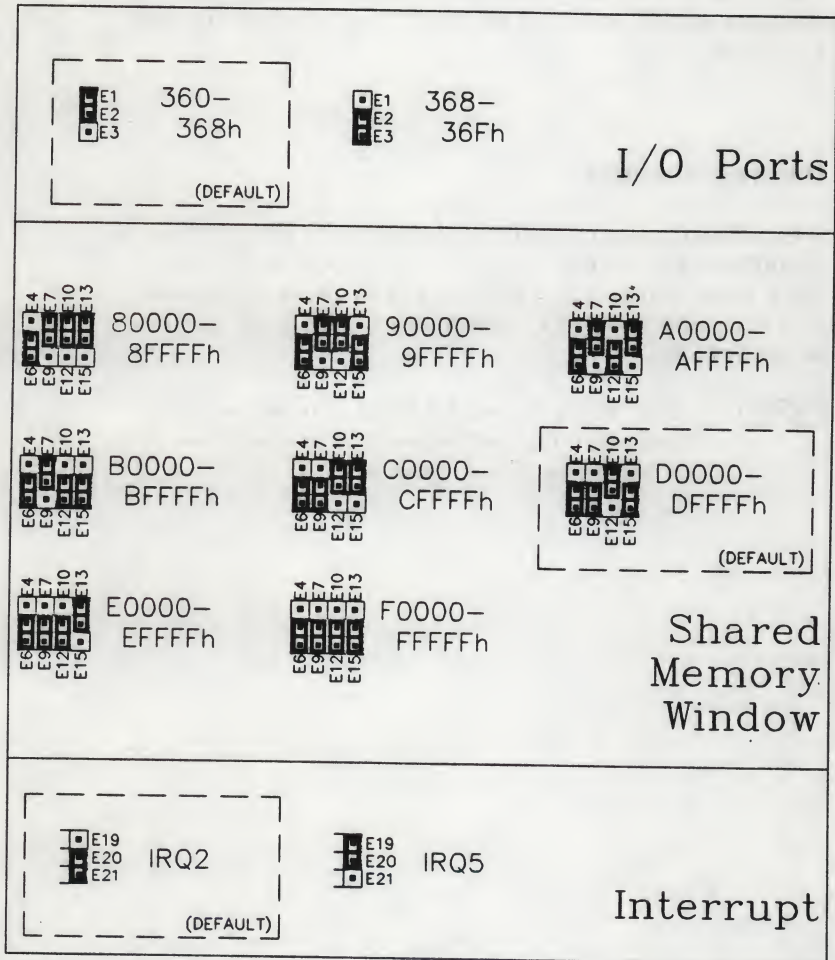
The Personal NIU requires a 64 Kbyte shared memory window. The default shared memory window is D0000-DFFFFh, which is recommended for most applications. Jumpers E4 to E15 change the shared memory window, from a base address of 80000h through a base address of FFFFFh. These jumpers are shown in Figure 2-6.



JUMPERS

Personal NIU

Figure 2-6



Personal NIU Jumper Settings

Figure 2-7

I/O Port Address

The default I/O port address is 360-367h. It can be changed to 368-36Fh. The jumper is installed on pins E1 and E2.

Interrupt Channel

The default interrupt channel is IRQ2. The jumper is installed on pins E20 and E21. If this is a conflict with other hardware, IRQ5 is available as an option. In fact, with some AT compatibles, this interrupt may be desirable.

NOTE

The DMA Request Channel is not used by any Net/One software and is therefore not covered in this document.

NIC JUMPER SETTINGS

There are four sets of jumpers on the NIC. Refer to Figure 2-8 for their locations, and Figures 2-9A and 2-9B for their settings. The jumpers determine the following parameters.

- Ethernet D-connector, or BNC connector if the card has an on-board transceiver
- Memory window starting address
- Interrupt channel
- Timer interrupt period

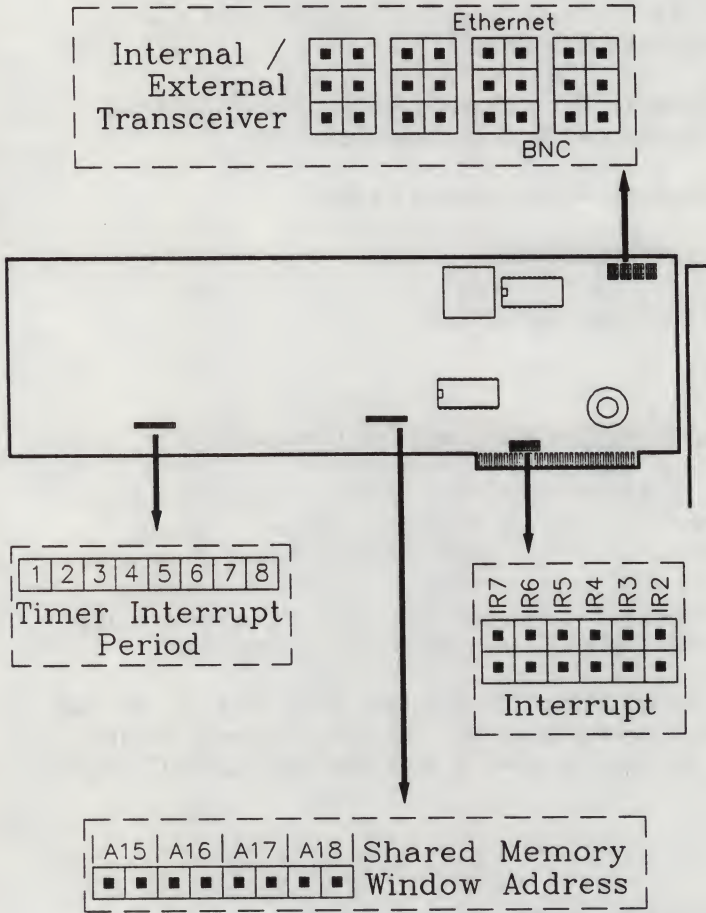
Ethernet D-Connector or BNC Connector

The on-board transceiver hardware contains a BNC connector and a set of jumpers (W1-W8). These jumpers determine whether the standard D-connector or the BNC connector is active. If you are using Ethernet cable, use the eight jumpers to connect the top two rows of pins and use the D-connector.

If you are using thin Ethernet cable, and the NIC has an on-board transceiver, use the jumpers to connect the bottom two rows of pins, and use the BNC connector.

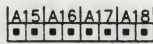
Memory Window Starting Address

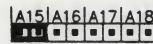
The memory window jumpers (A15-A18) represent the personal computer's memory addresses from 80000h to FFFFFh (512 Kbytes to 1 Mbyte), in 32K increments. The shared memory window starting address is determined by the positions of jumpers A15-A18. The default starting address is D0000-D7FFFh.

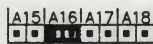


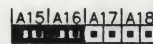
JUMPERS NIC

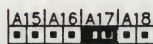
Figure 2-8

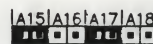
 80000–
87777h

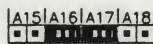
 88000–
8FFFFh

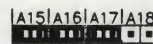
 90000–
97FFFh

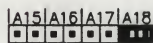
 98000–
9FFFFh

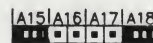
 A0000–
A7FFFh

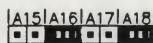
 A8000–
AFFFFh

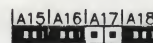
 B0000–
B7FFFh

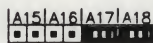
 B8000–
BFFFFh

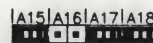
 C0000–
C7FFFh

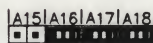
 C8000–
CFFFFh

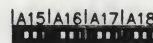
 D0000–
D7FFFh

 D8000–
DFFFFh

 E0000–
E7FFFh

 E8000–
EFFFFh

 F0000–
F7FFFh

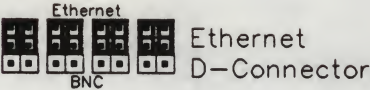
 F8000–
FFFFFh

Shared Memory Window

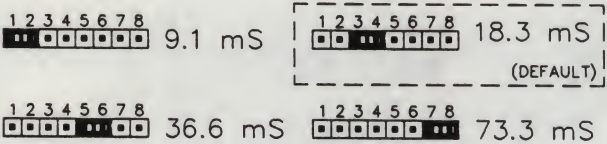
NIC Jumper Settings

A

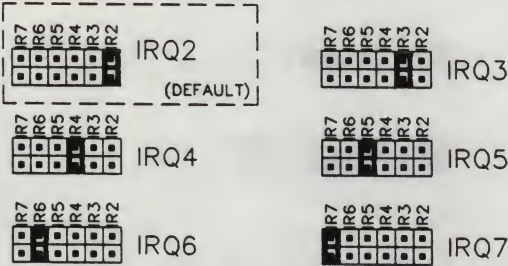
Figure 2-9A (1 of 2)



Network
Interface
Connector



Timer
Interrupt
Period



Interrupt

NIC Jumper Settings

B

Figure 2-9B (2 of 2)

Interrupt Channel

The interrupt channel jumper (IRQ2-IRQ7) determines which interrupt request line the NIC sends interrupts to the computer. IRQ2 is the default setting.

Timer Interrupt Period

The timer interrupt period jumpers affect the speed at which the NIC software runs. The factory-installed jumper is on the third and fourth pins, counting from the left, which is set at 18.3 milliseconds.

Do not change this setting if you will be using the standard Net/One Software. This setting is made available for flexibility when programming additional network environments in the NIC.

INSTALLATION OVERVIEW

OVERVIEW

Applies to:	all adapters
-------------	--------------

This chapter deals with general installation issues common to all adapters, and outlines some of the things you should do to prepare. It lists the tools you should have on hand, reminds you to check your jumper settings, and describes the network address and where to find it on the adapter.

TOOLS REQUIRED FOR INSTALLATION

To install any of the Net/One personal computer hardware, you will need a small flat-blade screwdriver. (Some compatibles require a phillips screwdriver.) If you have them, the tools listed below may make the installation easier.

- 1/4-inch nutdriver for removing and replacing the cover-mounting screws.
- 3/16-inch nutdriver for removing and replacing the card-slot cover-plate screws.

PREPARING THE PERSONAL COMPUTER FOR INSTALLATION

Before you install your network adapter, remove all connections between your computer and its monitor or external peripherals, disconnect all power cords from the wall, and remove the chassis cover. After you install your network adapter, replace the cover before reconnecting the system parts and power cords to avoid electric shock.

REMINDER: CHECK YOUR JUMPERS

The jumpers on the Net/One personal computer adapters have been pre-set at the factory. However, depending on the option boards you have installed in your computer, you may need to change them. Now is the time to make sure you have set them correctly. Be sure to write down any changes you have made. These will be important when it is time to do the software installation.

RECORDING THE NETWORK ADDRESS

In order to complete software installation on your network card, you will need to record the node ID number coded into the boot PROM of each network adapter, and furnish this to your network manager for construction of special files that uniquely identify your workstation or server. There are certain network connections that require this network ID for full connectivity to Net/One resources.

This number is recorded in two places on each NIUpC, Personal NIU, and NIC. One is located on the card-retaining bracket, and one is on a chip on the card. Refer to Figure 3-1 for label locations.

Even if you will not install the software yourself, be sure to record the address of each card you install. There is a table in Appendix C that provides space for you to write down a description of the computer and the number of the card you installed in it. Also note whether a particular card is a NIUpc, a Personal NIU, or a NIC.

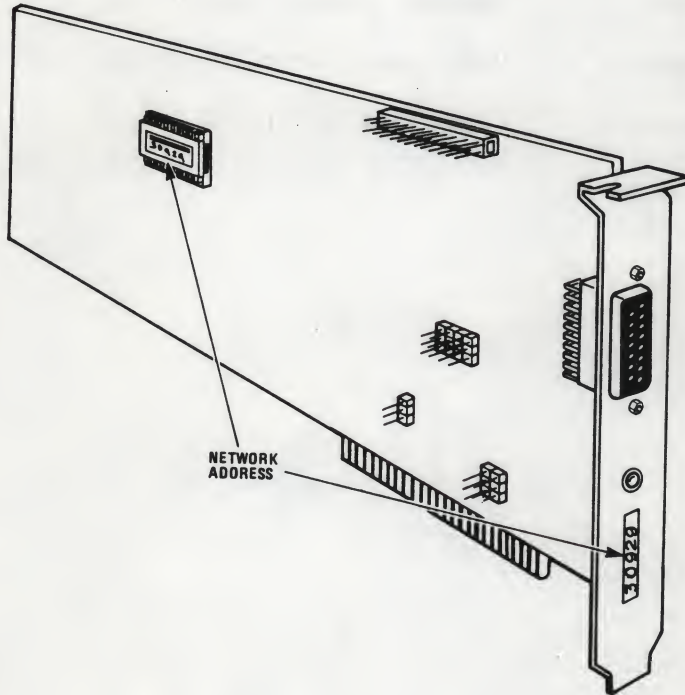


Figure 3-1 : Node ID Location

NEXT STEP

You are now ready to install your network adapter, and connect it to the network transmission media. Each of the next three chapters covers installation for a specific network type:

- Chapter 4: Baseband Ethernet Installation
- Chapter 5: Broadband Ethernet Installation
- Chapter 6: Token Ring Installation

BASEBAND ETHERNET INSTALLATION

INTRODUCTION

This chapter covers installation of the NIUpc, Personal NIU, and NIC in a baseband Ethernet network. After the adapter installation it discusses connecting the adapter to standard Ethernet cabling and Thin Ethernet cabling.

PREPARING A CARD SLOT

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)
Model 2272A	NIC (with internal transceiver)

1. With the chassis cover removed, face the front of your personal computer and look inside the system unit. You will see slotted connectors, some of which may have system cards installed. You can install the NIUpc, NIU, or NIC in any available slot.

If you are using an AT or an 80286 XT with the NIUpc, be sure to select a 16-bit bus slot. These are the slots that have two edge connectors. Those with only one edge connector are for 8-bit bus adapters.

2. When you have located the slot you will use, remove each screw holding the card-slot cover-plate with a screwdriver or 3/16-inch nutdriver. Set each screw aside.

CAUTION

Do not leave screws loose inside the computer. Should you drop a screw while installing your adapter card, be sure to remove it at once. Loose screws may short out the computer and cause permanent damage.

INSTALLING THE NETWORK ADAPTER

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)
Model 2272A	NIC (with internal transceiver)

Installing any one of the Net/One personal computer adapters is just like installing any personal computer hardware option board.

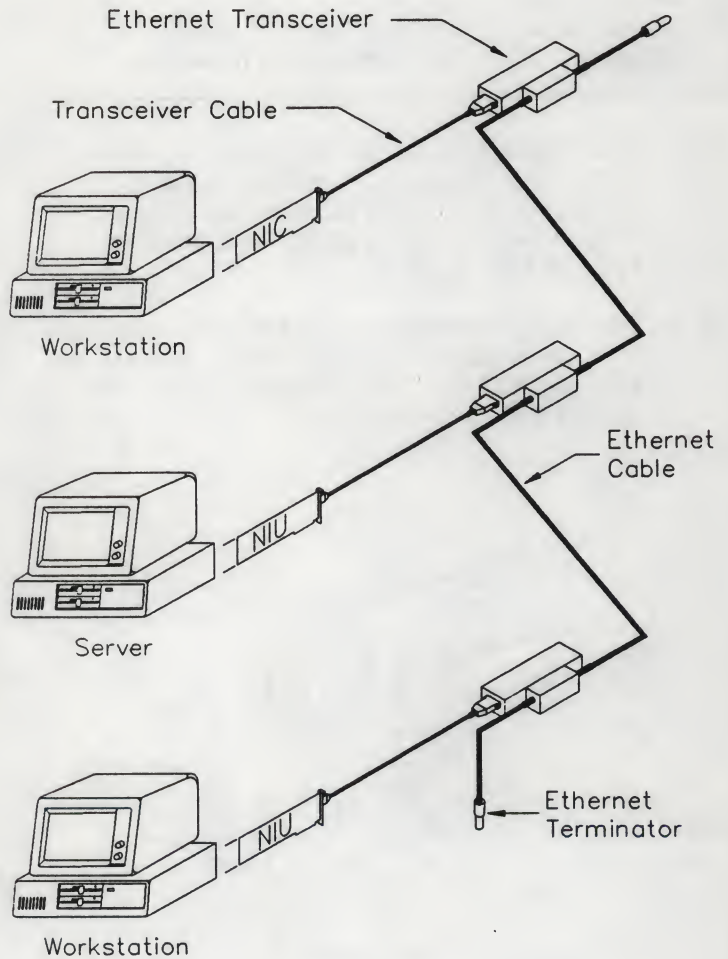
1. Hold the card by the top edge with both hands. Align the card with the card support and the card slot(s) on the main card. Press the card firmly, but gently, into the card slot(s) until it seats completely.
2. Align the hole in the card-retaining bracket with the screw hole in the rear panel of the system unit, and replace the card slot cover screw. This will help keep the adapter firmly seated, especially when connecting the card up to the network.
3. Replace the system cover before reconnecting power and peripherals to the computer. Be careful not to snag any cables with the screw-mount tabs located under the cover. If you have installed a broadband board and internal modem, be sure that the modem ribbon cable lies flat along the top of the option boards.

CONNECTING TO A STANDARD BASEBAND ETHERNET NETWORK

The NIUpc, Personal NIU, and NIC support standard baseband Ethernet. In baseband Ethernet networks, a *transceiver cable* connects the personal computer network adapter to a *transceiver* that is attached to the main Ethernet cable. Table 4-1 identifies the Ungermann-Bass part numbers of the cables and transceivers you might use during this installation.

Table 4-1
Ethernet Component Part Numbers

Ungermann-Bass Part Number	length (feet)	Description
8230A	10 ft	Transceiver Cable w/screws
8231A	20 ft	"
8232A	50 ft	"
8233A	80 ft	"
8234A	164 ft	"
8270A	10 M	Ethernet cable
8271A	100 M	"
8272A	250 M	"
8273A	500 M	"
5210A	---	Transceiver
8304A	---	Ethernet Terminator



Ethernet

Figure 4-1

Connecting the Adapter to a Transceiver

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)

1. Attach the 15-pin male connector on the transceiver cable to the 15-pin female D-connector on the NIUpc, Personal NIU, or NIC at the rear of your personal computer (Figure 4-2).
2. Insert the thumbscrews on the cable connector into the holes on the lock-post on the NIUpc, Personal NIU, or NIC. Lightly tighten the screws with a screwdriver.

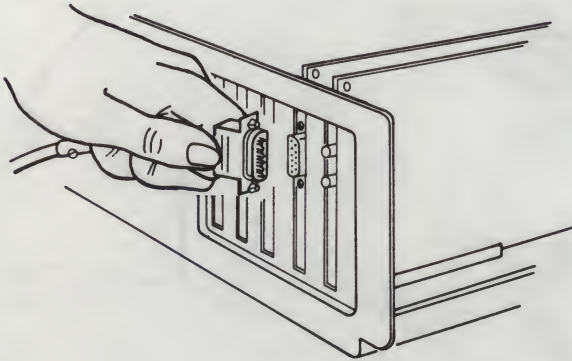


Figure 4-2
Attaching a Transceiver Cable to a Net/One Personal
Computer Adapter

3. Slide the hold-down clip to the right "open" position as shown in Figure 4-3.

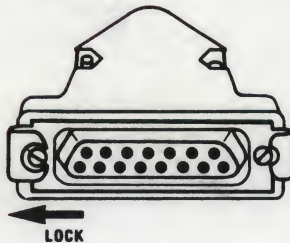


Figure 4-3
Securing Cable Hold-Down Clips at Transceiver

4. Align the plug with the socket on the transceiver (Figure 4-4). Connect them firmly.
5. Slide the hold-down clip to the left "locked" position as shown in Figure 4-3. This hold-down hardware prevents cable disconnection during operation.

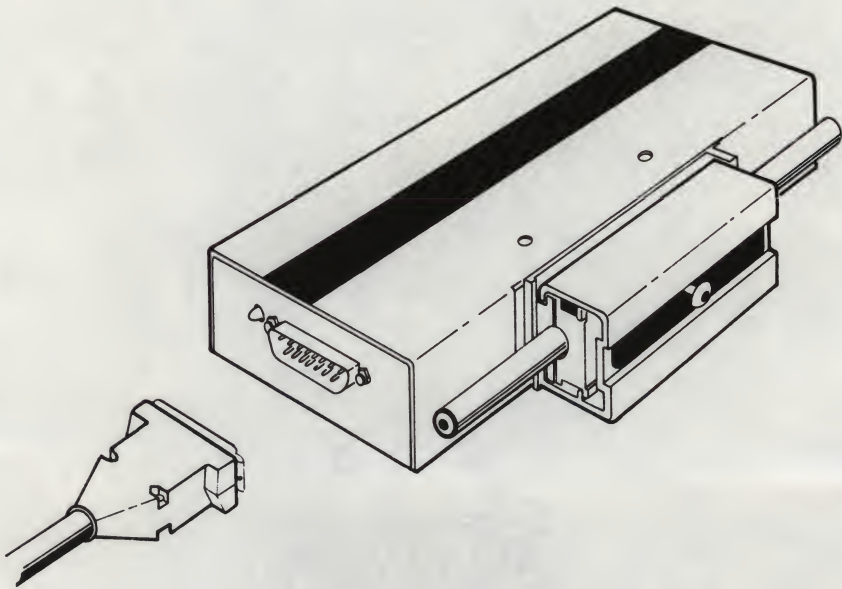


Figure 4-4
Attaching Transceiver Cable to Transceiver

CONNECTING TO A THIN ETHERNET NETWORK

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)
Model 2272A	NIC (with internal transceiver)

The NIUpc, 3270 NIUpc, Personal NIU, and NIC can be connected to "thin" Ethernet: Ethernet using RG-58A/U cable and BNC connectors. Figure 4-5 illustrates the components in a Thin Ethernet system. Thin Ethernet requires a different transceiver than standard Ethernet. Also, one NIC model has an on-board thin Ethernet transceiver that facilitates connection to this media; it is discussed separately.

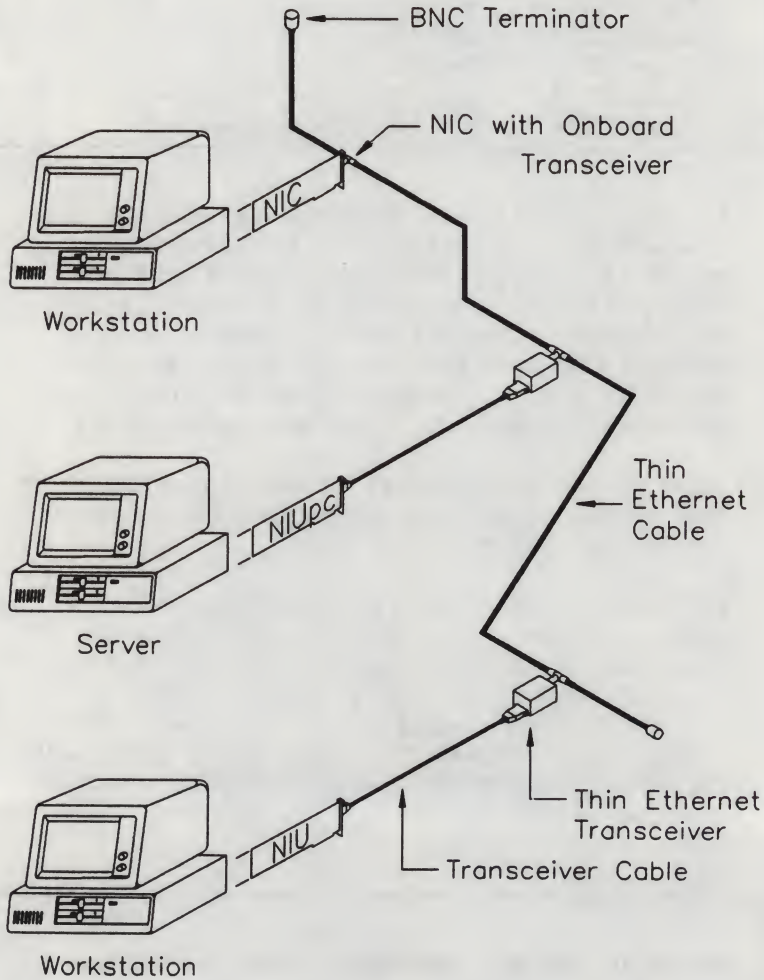
Table 4-2 lists part numbers for cables, terminators, BNC hardware, and other components you may need for this installation.

Each node is connected to a thin Ethernet network using a standard BNC connector. This means that the cable must be spliced or tapped with a BNC connector for every location at which you have a node.

Instructions for attaching connectors are not included in this manual. To avoid having to splice cables, order the right cable lengths you need with BNC connectors installed on each end.

CAUTION

Do not let any BNC connector or metal cable plant connection come in contact with any other metal such as a cable tray or building structural member. Such contact grounds the network cable and can damage the network components and cause the network to fail.



Thin Ethernet

Figure 4-5

Table 4-2
Thin Ethernet Component Part Numbers

Ungermann- Bass Part Number	length (feet)	Description
8230A	10 ft	Transceiver Cable w/screws
8231A	20 ft	"
8232A	50 ft	"
8233A	80 ft	"
8234A	164 ft	"
8280A	3 M	Thin Ethernet Coaxial Cable
8281A	10 M	"
8282A	15 M	"
8283A	30 M	"
8284A	100 M	"
8304A	—	Thin Ethernet (BNC) Terminator (pair)
8382A	—	BNC Barrel Connector
8385A	—	BNC "T" Adapter
5211A	—	Thin Ethernet Transceiver

Connecting Adapters with External Transceivers

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)

Network adapters which use external transceivers are connected to the Thin Ethernet transceiver in essentially the same fashion as standard Ethernet. See the section above for instructions.

The major difference is in the way that the transceiver is connected to the Thin Ethernet cable with a BNC connector T-adapter (Figure 4-6 shows a T adapter being attached to the NIC with an onboard transceiver; the method is similar for the transceiver). One side of the adapter is attached to the BNC connector on the transceiver. The other two ends connect to the network cable. You may either extend the cable from both remaining BNC female jacks, or you may terminate the cable on one side (terminating the cable is discussed later). General instructions for installing a BNC T adapter are given below.

Connecting an NIC with Onboard Transceiver

Applies to:

Model 2272A

NIC (with internal transceiver)

The NIC has an optional on-board transceiver that replaces the external transceiver. In this situation, the network cable connects directly to NIC.

Use a BNC T-adapter to connect the Thin Ethernet cable to the NIC (Figure 4-6). One side of the adapter is attached to the BNC connector on the NIC card. You may either extend the cable from both remaining BNC female jacks, or you may terminate the cable on one side (terminating the cable is discussed later).

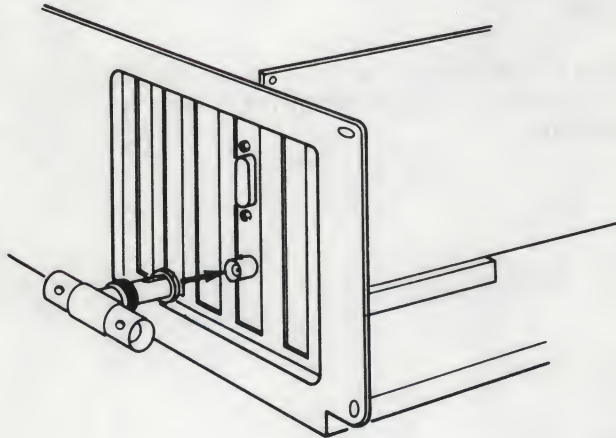


Figure 4-6
Attaching the BNC T-Adapter to the NIC

General Instructions for BNC T Adapter

Applies to:

Model PC2010	NIUpc
Model PC2030	3270 NIUpc
Model 2261A	Personal NIU
Model 2271A	NIC (with external transceiver)
Model 2272A	NIC (with internal transceiver)

1. Turn off the personal computer before attaching it to the network.
2. Line up the post on the BNC connector ring with the slot on the T-adapter (Figure 4-6).
3. Push the connector onto the ring until you can see the post in the slot on the connector.
4. Turn the connector clockwise until the post will go no farther into the slot.
5. Attach a length of thin coaxial cable to one or both ends of the T-adapter (Figure 4-7, next page).

If cable is attached only to one end of the adapter, see below for instructions for installing a terminator on the other end.

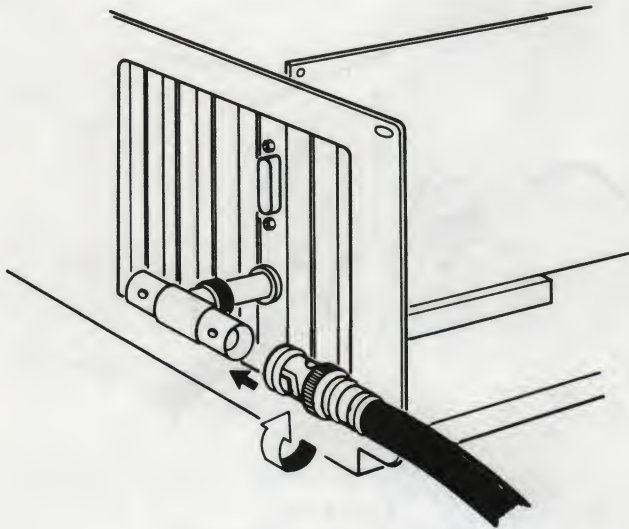


Figure 4-7
Attaching the Cable to the T-Adapter

Installing Terminators on Thin Coaxial Cable

For your thin coaxial cable plant to function properly, you must thread a 50-ohm male BNC terminator into the female BNC connector at each end of the cable plant (Figure 4-8). If your RG-58A/U thin coaxial cable does not already have BNC connectors on it, however, you must put them on before installing the terminators.

You must ground one end of the cable to a suitable ground point, such as the screw on a wall outlet plate. One terminator (in the set of two) has a post on the end for attaching a ground wire. Do not ground both ends of the cable.

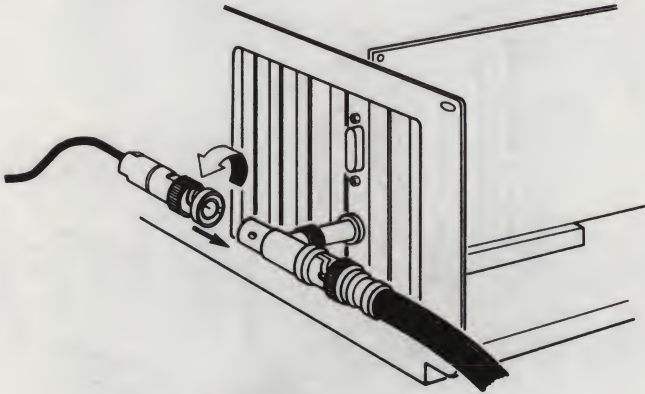


Figure 4-8
Installing A BNC Terminator

Installing a BNC Barrel Adapter

Any time you remove a transceiver (or NIC with internal transceiver) from the Thin Ethernet network you must reconnect the two network cables to ensure network continuity; taking out the T adapter breaks the network. To do this, replace the T adapter with a BNC barrel adapter (Figure 4-9).

To prevent signal reflections, keep these barrel adapter splices to a minimum.

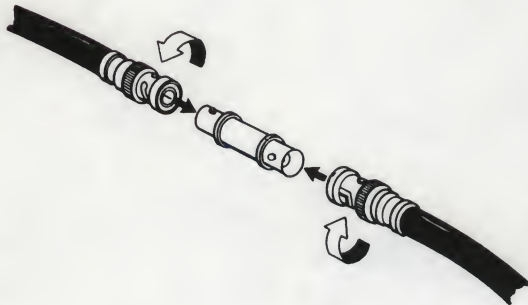


Figure 4-9
Installing a BNC Barrel Adapter

BROADBAND ETHERNET INSTALLATION

INTRODUCTION

This chapter covers the installation of the NIUpc, 3270 NIUpc, Personal NIU, and NIC, in a broadband Ethernet Network.

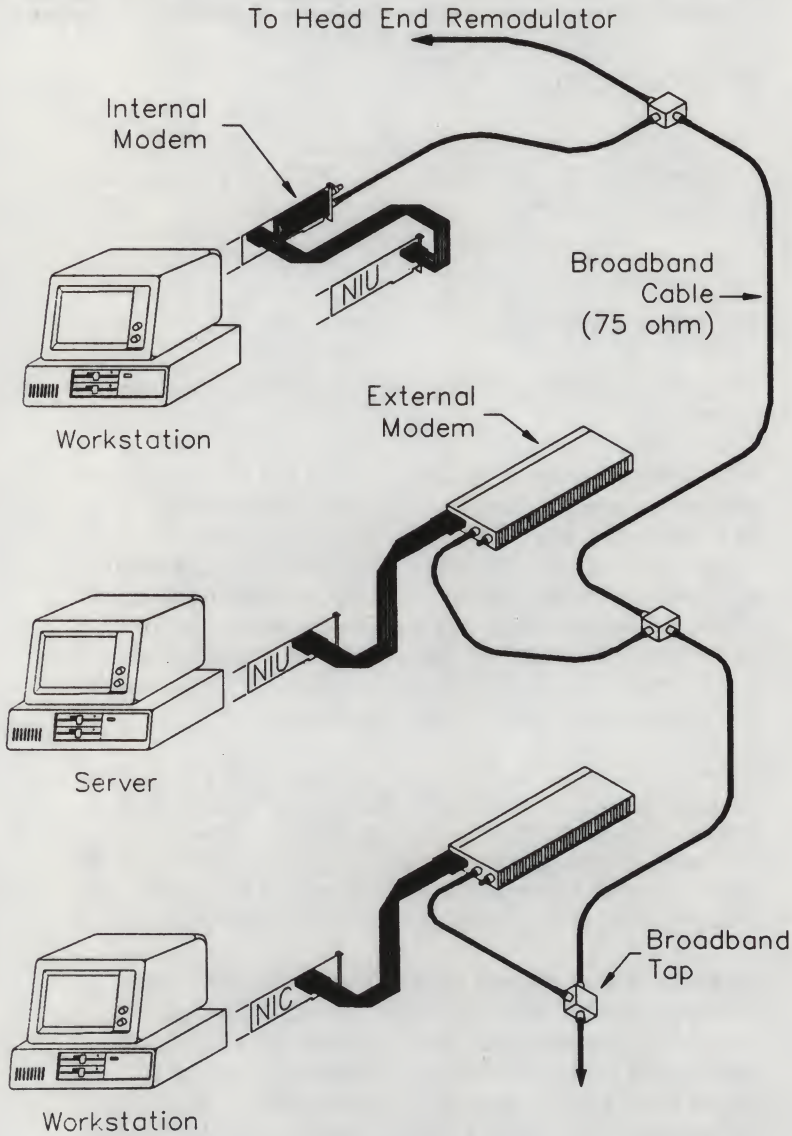
Broadband Systems

Figure 5-1 illustrates the components in a broadband system.

Broadband Ethernet is similar to a CATV (cable TV) system, in that it provides several independent channels on a cable, each with its own carrier frequency. Radio frequency modems at each node modulate and demodulate baseband Ethernet signals from the network adapters onto the network cable. Broadband systems use hardware very similar to CATV systems: RG-59 coaxial cable, "F" type screw-on connectors, and splitters or multitaps.

Some broadband systems use a single cable which carries the signal both into and out of the modem. Other systems have two cables (called a *dual-cable* system), in which one cable carries the signal into the modem, and the other carries it out. The cables in a dual cable system are designated *forward* and *reverse*.

In either case *splitters* or *multitaps* will have been installed which distribute the signals between the main coaxial cable and individual nodes. Each modem associated with a personal computer is connected to the multitap with one or two *drop cables* (depending on whether you have a single- or dual-cable system). In some installations a cable is provided from the multitap to a wall plate with a connector; in that case you connect a drop cable from the modem to the wall outlet.



Broadband

Figure 5-1

Broadband Network Adapters

Each network adapter family offers two kinds of broadband modems:

- *internal modems*: a modem installed in an empty card slot in a personal computer, and connected to the network adapter through a ribbon cable (NIUpc, 3270 NIUpc, Personal NIU, NIC);
- *external modems*: the same modem circuit board mounted in a standalone enclosure, and connected to the network adapter through a ribbon cable and connector mounted on the back panel of the personal computer (Personal NIU, NIC).

In addition, each modem comes in either single- or dual-cable configurations. Table 5-1 summarizes the available broadband network adapters.

Table 5-1 Broadband Ethernet Network Adapters	
<i>NIUpc Family:</i>	
NIUpc	
(internal single-cable modem)	PC2011
(internal dual-cable modem)	PC2012
3270 NIUpc	
(internal single-cable modem)	PC2031
(internal dual-cable modem)	PC2032
<i>Personal NIU Family</i>	
(internal single cable modem)	2360A
(internal dual-cable modem)	2360B
(external single-cable modem)	2362A
(external dual-cable modem)	2362B
<i>NIC Family:</i>	
(internal single-cable modem)	2370A
(internal dual-cable modem)	2370B
(external single-cable modem)	2372A
(external dual-cable modem)	2372B

Installation Overview

The following sections cover these steps in the broadband installation:

- preparing a slot in the personal computer;
- installing a network adapter and internal modem;
- installing a network adapter and external modem;
- single-cable connection; or
- dual-cable connection.

Some general cautions to observe:

1. **Do not connect or disconnect the modem interface cable unless AC power to the personal computer is off. If you fail to observe this precaution, you may permanently damage the power supply or internal logic of the personal computer.**
2. Do not attach two interface cables together to increase the distance between the modem and the cable.
3. Do not exceed a 25-foot length of drop cable between a modem and a cable system outlet; or a total of 75 feet between the cable system multitap and the modem.

PREPARING A CARD SLOT

Applies to:

All broadband adapters

1. With the chassis cover removed, face the front of your personal computer and look inside the system unit. You will see slotted connectors, some of which may have system cards installed. You can install the NIUpc or NIC in any available slot.

If you are using an AT or an 80286 XT with the NIUpc, be sure to select a 16-bit bus slot. These are the slots that have two edge connectors. Those with only one edge connector are for 8-bit bus adapters.

2. When you have located the slot you will use, remove each screw holding the card-slot cover-plate with a screwdriver or 3/16-inch nutdriver. Set each screw aside.

CAUTION

Do not leave screws loose inside the computer. Should you drop a screw while installing your adapter card, be sure to remove it at once. Loose screws may short out the computer and cause permanent damage.

INSTALLING A NETWORK ADAPTER WITH EXTERNAL MODEM

Applies to:

Model 2362A	Personal NIU (ext. single-cable modem)
Model 2362B	Personal NIU (ext. dual-cable modem)
Model 2372A	NIC (ext. single-cable modem)
Model 2372B	NIC (ext. dual-cable modem)

Installing a Net/One network adapter in a personal computer is just like installing any personal computer hardware option board.

1. Hold the card by the top edge with both hands. Align the card with the card support and the card slot(s) on the main card. Press the card firmly, but gently, into the card slot(s) until it seats completely.
2. Align the hole in the card-retaining bracket with the screw hole in the rear panel of the system unit, and replace the card slot cover screw. This will help keep the adapter firmly seated, especially when connecting the card to the network.
3. Replace the system cover before reconnecting power and peripherals to the computer. Be careful not to snag any cables with the screw-mount tabs located under the cover. If you have installed a broadband board and internal modem, be sure that the modem ribbon cable lies flat along the top of the option boards.

Connecting your Network Adapter to an External Modem

You will have received the following items with your external modem:

- External modem
- Ribbon cable with 26-pin male external connector and 26-pin female connector
- Shielded flat cable with two shielded 26-pin female connectors

Many personal computers have a removable cover plate on the back panel for a connector through the PC chassis. The external modem uses this opening for the shielded cable connecting the external modem to the personal computer. This connector is located midway across the back panel of the computer, slightly to the left of the card slots when seen from the rear. The internal ribbon cable is designed to be attached from the network adapter to this external connector slot. See Figure 5-2. The IBM PC/XT, AT, and a few compatibles have this connector location.

NOTE

If your personal computer does not have this chassis connector knockout, you will have to run the internal cable through one of the expansion slots, so that it can be connected to the external shielded cable.

1. Unscrew the small screw that holds the connector plate. Keep track of this screw; you will need it later. Remove the plate.
2. From the outside of the personal computer, insert the ribbon cable through the opening in the slot, with the 26-pin female connector first.

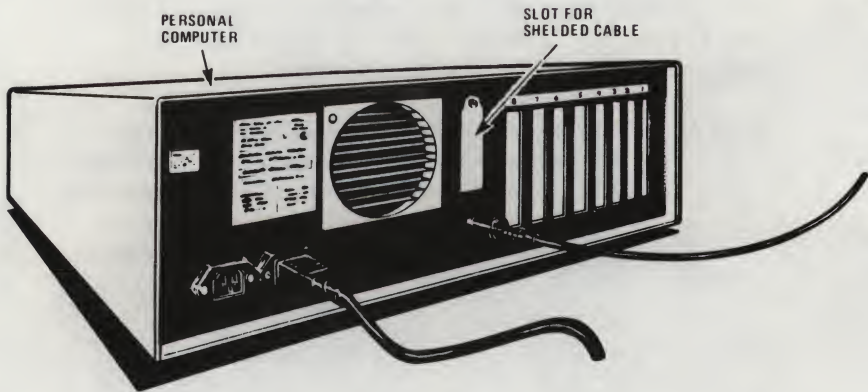


Figure 5-2
Chassis Connector on Back of Personal Computer

3. Attach the lip of the 26-pin external connector to the bottom of the slot opening. Push the top of the external connector until the top hole lines up with the screw hole in the personal computer back panel. See Figure 5-3.

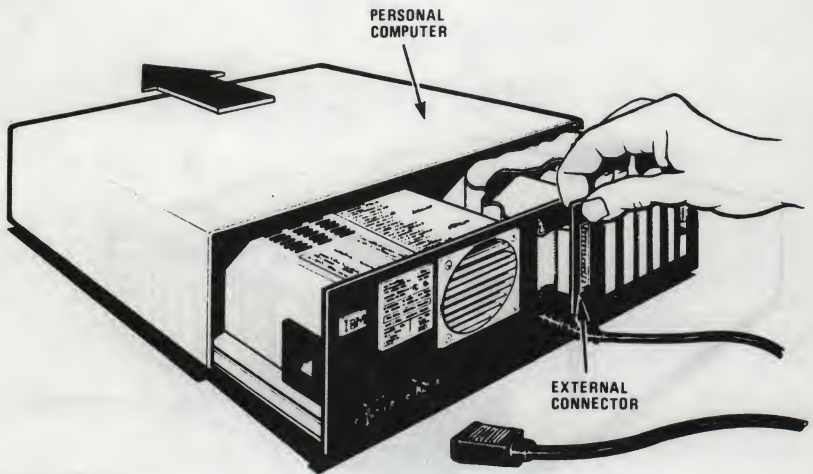


Figure 5-3
Attaching External Connector to PC Back Panel

4. With the small screw that you earlier removed, connect the external connector to the personal computer back panel.
5. Connect the 26-pin female connector to the NIUpc or NIC. See Figure 5-4. This connector is keyed, so that it can only be installed one way.

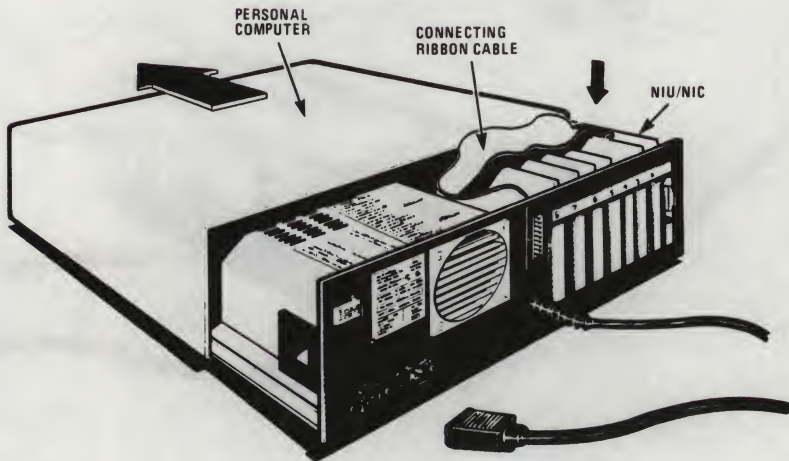


Figure 5-4
Connecting Ribbon Cable to Adapter

6. Connect one of the shield flat cable's 26-pin connectors to the external connector on the personal computer back panel. See Figure 5-5. This connector has one "blind" pin connector, so that it can only go in the right way.
7. Connect the other end of the flat cable to the external modem's 26-pin male connector. Match the arrow on the cable to the arrow on the modem connector.

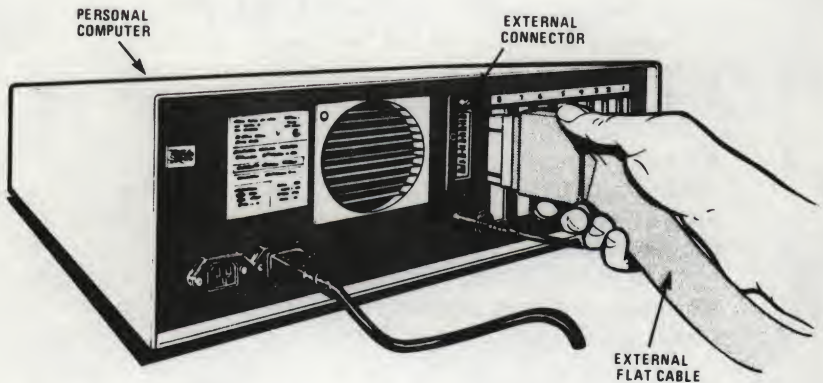


Figure 5-5
Attaching External Flat Cable to External Connector

INSTALLING A NETWORK ADAPTER WITH INTERNAL MODEM

Applies to:

Model PC2011	NIUpc (int. single-cable modem)
Model PC2012	NIUpc (int. dual-cable modem)
Model PC2031	3270 NIUpc (int. single-cable modem)
Model PC2032	3270 NIUpc (int. dual-cable modem)
Model 2360A	Personal NIU (int. single-cable modem)
Model 2360B	Personal NIU (int. dual-cable modem)
Model 2370A	NIC (int. single-cable modem)
Model 2370B	NIC (int. dual-cable modem)

Install the internal modem in the personal computer slot nearest the cover to allow for optimum heat dispersal. The adapter and modem are connected by a ribbon cable; pass the ribbon cable over the tops of any other adapters.

1. Hold the adapter by the top edge with both hands. Align the card with the card support and the card slot. Press the card firmly, but gently, into the card slot until it seats.

Align the hole in the card-retaining bracket with the screw hole in the rear panel of the system unit. Replace the card slot cover screw to keep the adapter firmly seated.

2. Attach the modem ribbon cable to the connector at the top edge of the adapter. The plug is keyed to only go in one way. Connect the other end of the ribbon cable to the modem card. Insert the modem into the leftmost slot, and replace its card slot cover screw.
3. Replace the system cover before reconnecting power and peripherals to the computer. Be careful not to snag any cables with the screw-mount tabs located under the cover. Be sure that the modem ribbon cable lies flat along the top of the option boards.

CONNECTING THE MODEM IN A SINGLE-CABLE SYSTEM

Applies to:

Model PC2011	NIUpc (int. single-cable modem)
Model PC2031	3270 NIUpc (int. single-cable modem)
Model 2360A	Personal NIU (int. single-cable modem)
Model 2362A	Personal NIU (ext. single-cable modem)
Model 2370A	NIC (int. single-cable modem)
Model 2372A	NIC (ext. single-cable modem)

1. Attach one end of the drop cable to the socket of the wall outlet or the multitap marked **SINGLE** or **FORWARD** (Figures 5-6 and 5-7).
2. Firmly hand tighten the connector or snug lightly with a wrench.
3. Attach the other end of the drop cable to the lower F-connector on the modem card (Figure 5-8).

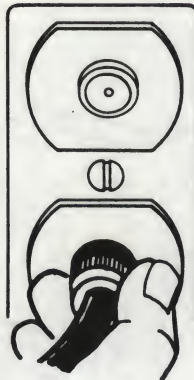


Figure 5-6
Attaching Cable to Wall Outlet

4. Firmly hand tighten the connector or snug lightly with a wrench.
5. Make sure that the upper F-connector on the modem is covered with a terminator.

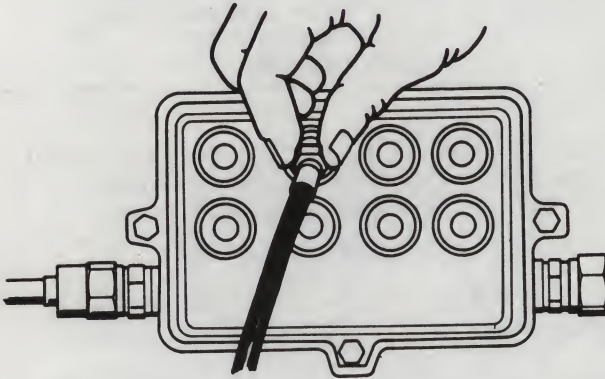


Figure 5-7
Attaching Cable to Multitap

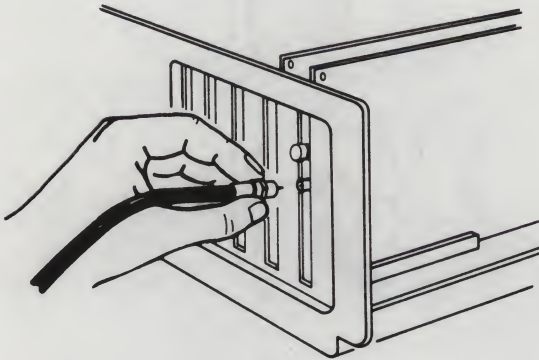


Figure 5-8
Attaching Cable to Lower F-Connector

CONNECTING A MODEM TO A DUAL-CABLE SYSTEM

Applies to:

Model PC2012	NIUpc (int. dual-cable modem)
Model PC2032	3270 NIUpc (int. dual-cable modem)
Model 2360B	Personal NIU (int. dual-cable modem)
Model 2362B	Personal NIU (ext. dual-cable modem)
Model 2370B	NIC (int. dual-cable modem)
Model 2372B	NIC (ext. dual-cable modem)

1. Attach an end of one drop cable to the bottom F-connector located at the back of the modem card (Figure 5-9). This cable will carry the FORWARD signals.
2. Firmly hand tighten the threaded F-connector or tighten lightly with a wrench.

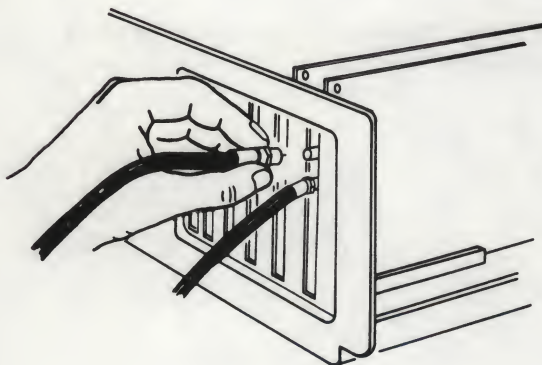


Figure 5-9
Attaching Cable to Upper F-Connector

3. Attach the other end of the FORWARD drop cable to the wall outlet or the multitap labeled FORWARD. When your wall outlet or multitap is not labeled, ask your network administrator which outlet or multitap is attached to your FORWARD cable and which is attached to your REVERSE cable.
4. Firmly hand tighten the threaded F-connector or tighten lightly with a wrench.
5. Attach one end of the other drop cable to the top F-connector on the modem card. This cable will carry the REVERSE signals.
6. Firmly hand tighten the connector or snug lightly with a wrench.
7. Attach the other end of the second cable to the wall outlet or the multitap labeled REVERSE.
8. Firmly hand tighten the connector or snug lightly with a wrench.

TOKEN RING INSTALLATION

INTRODUCTION

This chapter covers the installation of the NIUpc (Model PC2500) in a Token Ring network.

The Token Ring Network

Figure 6-1 on the next page illustrates the components in a Token Ring installation. The installation is quite simple: attach a cable from the NIUpc/Token Ring to an available port on a Distributed Wiring Concentrator (or an IBM Multistation Access Unit). Consult the *Token Ring Distributed Wiring Concentrator Installation Guide* for information on configuring the DWC.

Table 6-1 lists the part numbers of some Token Ring components.

Table 6-1 Token Ring Component Part Numbers	
Ungermann- Bass Part Number	Description
2541D	Distributed Wiring Concentrator (115V)
2542D	" (230V)
2543D	" (100V)
8108A	Adapter cable

NOTE

The instructions below apply to the "Type 1" token ring cabling.

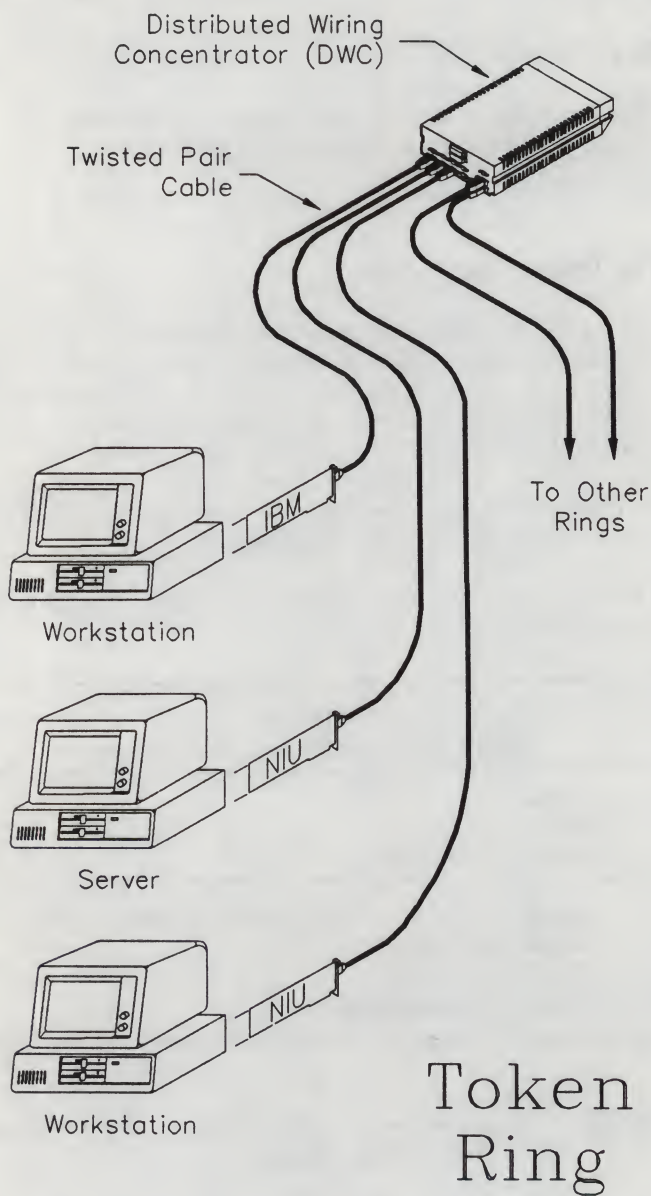


Figure 6-1

1. Attach the 9-pin male D-connector on the token ring cable to the 9-pin female D-connector on the NIUpc/TR at the rear of your personal computer (Figure 6-2).
2. Insert the thumbscrews on the cable connector into the holes on the lock-post on the NIUpc/TR. Lightly tighten the screws with a screwdriver.

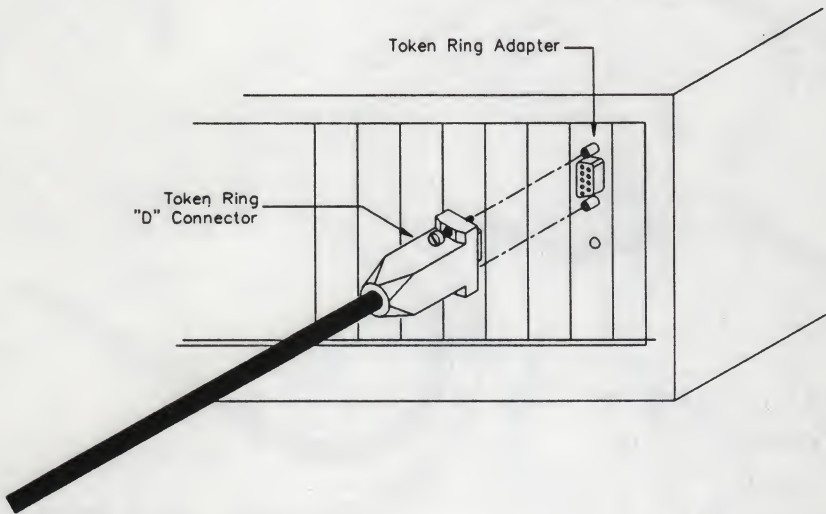
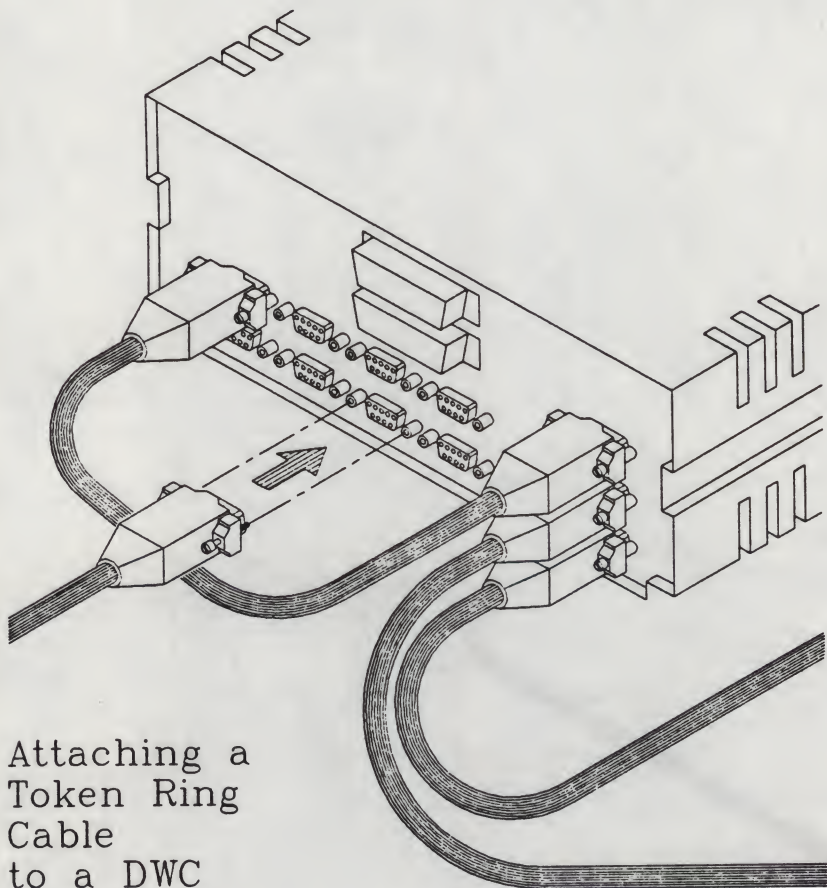


Figure 6-2
Attaching a Token Ring Cable to an NIUpc/TR

3. Attach the 9-pin male D-connector on the other end of the token ring cable to the 9-pin female D-connector on the DWC port (Figure 6-2).
4. Insert the thumbscrews on the cable connector into the holes on the lock-post on the DWC. Lightly tighten the screws with a screwdriver.



Attaching a
Token Ring
Cable
to a DWC

Figure 6-3

7 SYSTEM DIAGNOSTICS

INTRODUCTION

Each Net/One network adapter has diagnostics in its system memory that check its operation. These diagnostics are run each time your personal computer is booted. This chapter will assist you with basic troubleshooting, should you run into any problems booting your adapter.

ON-BOARD DIAGNOSTICS

The NIUpc, 3270 NIUpc, and Personal NIU have a red LED indicator on their mounting brackets, visible from the back of the host personal computer. (The NIC has no LED or other external error indicator.) This indicator should be lit or blinking only during the system diagnostics routine. See Figure 7-1.

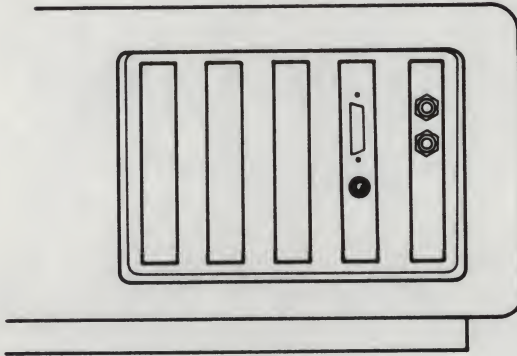


Figure 7-1
NIUpc and Personal NIU LED

TROUBLESHOOTING

If the diagnostic LED remains on after system diagnostics, or you are having problems with the NIC, there are eight hardware related areas to consider as potential problems. These are:

1. **Jumper settings on the network card not set properly.** Check to make sure the jumper settings on the network card are set correctly. If you are not using the default settings, you will need to make changes to the software to accomodate the hardware changes. See the *Software Installation Division of the BNS/PC Interface Manual*, or the *Microsoft Networks Manager's Guide*, for instructions.
2. **Hardware conflicts between the network card and other hardware installed in the personal computer.** Check to make sure that any optional hardware that is installed in the personal computer do not use the same hardware interrupts, shared memory window, and I/O port addresses that the network card uses. If there is a conflict, you will have to change either the network card jumper settings or the optional hardware.
3. **Bad physical connection.** For Ethernet baseband networks, check that the transceiver is properly connected to Ethernet cable and that the transceiver cable is properly connected between the transceiver and your personal computer. For Ethernet broadband networks, check that the modem cable is properly connected to the broadband modem. Also check that the cable between the NIU/NIC is properly connected to the modem. For Token-Ring networks, check to make sure that the token ring cable between the NIU or IBM adapter is properly connected to the DWC or IBM MAU, whichever unit that you are using.

4. **Bad transceiver, modem, or token ring cable.**
If the connection looks good, one possibility is a bad cable between the network card and the device that connects it to the network. For Ethernet baseband this is the transceiver cable. For broadband it is the modem cable. For Token-Ring networks, it is the twisted pair cable between the NIUpc/TR and the DWC/MAU. It might be worthwhile to swap this cable with one that works on another personal computer. Reboot the personal computer to verify that this has corrected the problem.
5. **Bad transceiver, modem, or DWC.** If all of the items above did not work, try replacing the device that connects the personal computer up to the network. For Ethernet baseband, this is the transceiver. Try replacing the transceiver with one that you know works.

For broadband networks, the modem may be bad. Try replacing the modem with one that you know works.

For the Token-Ring, it might be the DWC (or MAU). Because the DWC can connect up to 10 devices, you may want to try another DWC port, especially if other personal computers are working on the DWC. Try a port that works. If none work, try another DWC.

6. **Personal computer power supply too small.** Try an experiment: take out one of the other cards installed in the personal computer, not necessary to boot the personal computer. (e.g. enhanced memory board or serial/parallel card) Leave the network hardware installed. See if the personal computer will boot. If it does when some of the other hardware is not installed, your power supply is probably not large enough. Many personal computers can be upgraded with larger power supplies.

7. **Incompatible computer.** Some personal computers that claim to be compatible may, in fact, lack full compatibility. Check with your local Ungermann-Bass representative to see which personal computers have been tested. The incompatibility may be in the personal computer's ROM BIOS, in its version of DOS, or in its hardware design.
8. **Bad network card.** If none of the above suggestions work, you may have a bad network card. Two approaches are available to verify this. First, use a loop back plug to see if the network card will pass diagnostics. Loop back plugs are available for both Ethernet and Token-Ring networks. For NICs with transceivers, this will not be possible. For broadband NIUs and NICs, there is no loop back currently available. Once the loop back is installed, reboot the personal computer. The network card will be working properly if the following message is displayed:

PERSONAL CONNECTION: Passed its diagnostic tests

If you do not get the above message, or get an error message, there may be a problem with your network card. In that case, try replacing the network card with another card, especially one that is known to work. If the new network card works, then the previously installed network card most likely does not work, especially if all of the other steps above this were checked. If it does not work, make sure that you have looked at the other steps.

If after trying all of these solutions and you are still unsuccessful, call your network manager or your Ungermann-Bass "800" line for assistance.

NOTE

There are no user-serviceable parts on the NIUpc, Personal NIU or NIC, or on any personal computer supplied by Ungermann-Bass. Do not attempt to service this equipment.

ADDITIONAL TROUBLESHOOTING

A great deal of the network operation has to do with software. Therefore, in order to thoroughly troubleshoot any problems connecting to the network, network software considerations need to be taken into account. Therefore, refer to the troubleshooting sections (Appendix C) of the *Software Installation Division* in the *BNS/PC Interface Manual*, or the *Microsoft Networks Manager's Guide* (Appendix E), for additional assistance.

RESHIPMENT PROCEDURE

When you suspect that there is a problem with a network adapter, call your Ungermann-Bass representative for assistance. Your U-B representative may provide a solution to your problem without your having to return the equipment.

If you must return the NIUpc or NIC after consulting your representative, ship it in its original shipping container and packing material, or in an antistatic bag inside an impact-resistant foam-lined carton.

You must have a Return Material Authorization (RMA) number from Ungermann-Bass before you can ship your Ungermann-Bass equipment to the Repair Center. Call the Repair Center first for an RMA number. Be sure you have the following before you make the call:

- Model number of the unit or board. If you don't have the model number of a board, you may give the assembly part number.
- Serial number(s) of the unit or board you want repaired or exchanged.
- Ship to address, telephone number, and attention to name.
- Bill-to address if different from ship to address.
- Purchase order number if not under warranty.
- Brief description of the failure/problem.

On boards, you will find part-number and serial-number labels. If you have a mother board with a daughter board attached to it, you must provide part and serial numbers for each.

Please do not send cables, power cords, manuals, or any other miscellaneous items with your equipment. Ungermann-Bass does not repair these. If you have any questions, call your local Ungermann-Bass representative or the Customer Service "800" number.

APPENDIX A

NETWORK INTERFACE ADAPTER CONFIGURATION OPTIONS

INTRODUCTION

This appendix discusses the various configuration options of the NIUpc, 3270 NIUpc, NIUpc/Token Ring, the Personal NIU, the NIC, and the IBM Token Ring Network PC Adapter. These options are controlled by the settings of jumpers or dipswitches on the hardware, and the command line parameters of the network interface software. **The hardware settings and software command line settings must always match exactly.** Refer to Chapter 2 of this *Hardware Guide* for more information about jumper settings.

The software has been designed to use default values which correspond to hardware settings on the boards as set at the factory; these default settings work in most situations. This appendix provides the necessary guidance if memory, I/O, or interrupt conflicts necessitate a change to any of these parameters.

Topics covered in this chapter:

- general installation issues
- possible memory, I/O, and port assignment conflicts
- NIUpc and 3270 NIUpc configuration
- NIUpc/Token Ring configuration
- Personal NIU configuration
- NIC configuration
- IBM Token Ring Network PC Adapter configuration

GENERAL INSTALLATION ISSUES

Hardware Jumper Settings

Each of the six network interface adapters has hardware programmable features; the software which is loaded to support those adapters must be made aware of these settings through command line parameters when the software is loaded.

Chapter 2 describes how to change the jumper settings of Ungermann-Bass adapters. IBM's *Guide to Operations* for the adapter describes how to change the IBM PC Adapter's memory window dipswitch.

CAUTION

Changing these command line parameters when the software is loaded **WILL NOT** override the adapter jumper settings; rather, the conflict may cause the system to crash. If the parameters must be changed the jumpers on an adapter must be changed first, and the command line parameters changed to match.

Default Hardware Configurations

Each network interface adapter is shipped with standard factory-set jumper and dipswitch positions. The network interface software is written to expect these standard settings, and use them as its default values if no others are specified.

CAUTION

Because the software expects the hardware to be set up in a certain way, it is a very important to verify that the hardware is, in fact, configured to the default settings. If the hardware does not match the expectations of the software, the network interface will not work.

The default values for these adapters are listed in Table A-1 below. The figures in Chapter 2 will help you identify the corresponding jumpers.

Table A-1
Network Adapter Defaults

Network Adapter	shared memory window	I/O base address	interrupt	host system bus
NIUpc	C8000h	368h	3	8
3270 NIUpc	D8000h	368h	2/3*	8
NIUpc/Token Ring	D0000h	368h	2	8
Personal NIU	D0000h	360h	2	n/a
NIC	D0000h	n/a	2	n/a
IBM Token Ring Network PC Adapter I	D8000h	n/a	2	n/a
(*) IRQ2 is used by 3278/79 emulation functions; IRQ3 used by Net/One interface functions.				

Shared Memory

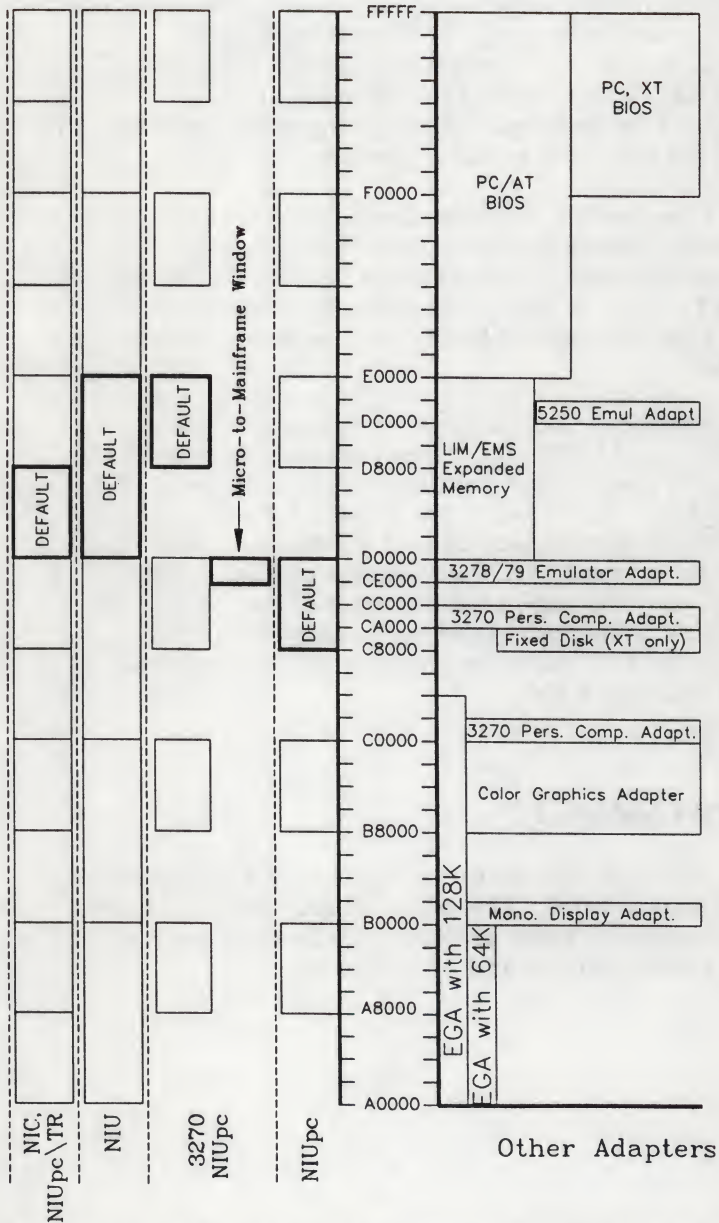
Each of the adapters uses shared memory (sometimes called "dual port memory") to exchange data with the host personal computer. The base address of the shared memory block is programmed with jumpers on the adapter card, and must be specified on software command lines. The size of the shared memory area varies with each adapter, as shown in Table A-2.

The block of shared memory is usually located somewhere between the 640K boundary (address A0000h) and the 960K boundary (address F0000h). Under certain circumstances shared memory could be located below A0000h; this is discussed later.

The first 640K of RAM in the PC is available for applications programs. The region above 640K, from A0000h through FFFFFh, is the *system memory*. Figure A-1 is a diagram of this region of memory. System memory includes ROM, and RAM used by various adapters, most notably display adapters; the figure shows possible memory assignments for various adapters. The network interface adapter's shared memory is also located somewhere in system memory. As Figure A-1 shows, this is an area which is unlikely to conflict with other adapters.

Table A-2
Shared Memory Window Size

Network Adapter	window size
NIUpc	32K
3270 NIUpc	32K
NIUpc/Token Ring	32K
Personal NIU	64K
NIC	32K
IBM Token Ring Network PC Adapter I	8K



Network Adapter Memory Considerations

Figure A-1

However, if there appears to be a conflict between the network interface adapter's shared memory and another device you will have to change the memory assignment of one device or the other. Consult Chapter 2 for information on changing the network interface adapter's memory jumpers.

Note also that the Personal Computer/AT and compatibles have an additional region set aside for read-only memory (this region is free on the PC and PC/XT). This is the region from 0E0000h through 0EFFFFh, and cannot be used for network adapters on the AT.

It is possible to use the block of memory between 80000h and A0000h, if no other memory is free. This region is usually used for application programs. If the personal computer has 512K or less of RAM, or it is feasible to remove the 128K of RAM above 80000h, then the network interface adapter can use a block of memory in this region for shared memory. Refer to the *Guide to Operations* for your computer, or the equivalent document, for information on installing and removing RAM.

I/O Port Addresses

Each network adapter uses a block of 8 I/O addresses for system control. This block of I/O can be jumper programmed to begin at 360h or 368h (also 350h or 358h for the NIUpc and 3270 NIUpc).

Interrupts

Various interrupts are available to each adapter to allow it to signal the system CPU for attention, and the selection of interrupt can be made through jumpers on each adapter. The default interrupt is 3 for the NIUpc and 3270 NIUpc, 2 for all other adapters. You may have to change this to avoid a conflict with other devices. Two general guidelines:

The IBM PC/XT and compatibles use interrupt 5 for the hard disk adapter, and this interrupt cannot be used for any other purpose.

The IBM PC/AT and compatibles use interrupt 2 to multiplex (combine) interrupts from several sources, to expand the number of available interrupts. It might be best to avoid using interrupt 2 if at all possible; interrupt 5 is most often the acceptable choice, since it is assigned to the second parallel port, which is rarely used.

NETWORK INTERFACE ADAPTER SOFTWARE

There is a set of software for each of the six types of network interface adapter. These software packages perform two functions:

- 1) They make each network interface adapter work, by providing drivers for the hardware.
- 2) They provide a uniform interface between the operating system or applications, and the adapter hardware. The mechanism of this interface is the *NETBIOS*, a standard interface specification originally developed by IBM.

Each set of software must be made aware of the option settings of the hardware it works with. The rest of this appendix defines the command line parameters that do this.

The six sets of software are:

NIUpc

The NIUpc has an onboard microprocessor, with enough software onboard in EPROM for diagnostics and loading. Its actual operating software must be loaded from disk.

The *LOADNIU.EXE* program loads the NIUpc's operating software into it from one of three files: *EX2NIUW.XFM*, *EX2NIU2.XFM*, and *EX2NIUS.XFM*. These files are sometimes called "personality" files, since each one makes the NIUpc function in different ways for different situations. The *EX2NIUW.XFM* file is best for workstation use, and allows the workstation 64 sessions, 3 virtual circuits and 1 port. The *EX2NIU2.XFM* file gives the NIUpc 32 sessions, 1 virtual circuit and 2 ports. The *EX2NIUS.XFM* is designed for a maximum number of sessions, 96, and provides one virtual circuit.

The NIUpc also uses the *XNSBIOS.EXE* program to provide its NETBIOS interface. When **XNSBIOS** is executed, it is loaded into the PC's memory, and then remains resident to provide the NETBIOS interface functions.

3270 NIUpc

The 3270 NIUpc uses **LOADNIU** to load the same personality files as the NIUpc, and also uses **XNSBIOS**. The 3270 NIUpc's micro-to-mainframe functions require an additional software module for support: *PAD.EXE*. **PAD** is the software which bridges the 3278/79 and IRMA emulation circuitry with the Net/One network interface.

NIUpc/Token Ring

LOADNIU loads one of three personality files for this board: *RXNIUW.XFM*, *RXNIU2.XFM*, and *RXNIUX.XFM*. The *RXNIUW.XFM* file gives the NIUpc/TR 9 sessions, 3 virtual circuits and 1 port. The *RXNIUX.XFM* gives the NIUpc/TR 5 sessions, 1 virtual circuit and 2 ports. The *RXNIUX.XFM* is designed for a maximum number of sessions, 32, and provides no virtual circuits or ports.

The Token Ring NIUpc uses the same *XNSBIOS.EXE* program as do the other NIUpc adapters. In addition, it requires a third program, *TRMAC.EXE*, which implements a software layer called *media access control*.

Personal NIU

The Personal NIU also has an onboard microprocessor, and uses operating software which is loaded in from disk. The **LOADNIU.EXE** program loads the Personal NIU's operating software using one of three files for this board: *EXNIUW.XFM*, *EXNIU2.XFM*, and *EXNIUS.XFM*.

These "personality" files are specified for different situations: the *EXNIUW.XFM* file is best for workstation use, and allows the workstation 9 sessions, 3 virtual circuits and 1 port. The *EXNIU2.XFM* file gives the NIU 5 sessions, 1 virtual circuit and 2 ports. The *EXNIUS.XFM* is designed for a maximum number of sessions, 32, and provides no virtual circuits or ports.

The Ethernet Personal NIU also uses the *XNSBIOS.EXE* program to provide its NETBIOS interface. When *XNSBIOS* is executed, it is loaded into the PC's memory, and then remains resident to provide the NETBIOS interface functions.

NIC

The NIC does not have an internal microprocessor. It is controlled by the personal computer's microprocessor, based on a driver program resident in the PC's memory. For this reason, adapters like the NIC and the IBM Token Ring Network adapter take up more space in workstation memory than the "smart" devices do. The estimated memory that these files take, not counting DOS or applications, is shown in parentheses below.

Three NIC programs combine the hardware driver circuitry with NETBIOS. Each offers different connection capacity as a tradeoff with the amount of memory consumed within the workstation. *EXNICW.EXE* (128K) gives the NIC 6 sessions, 1 virtual circuit and 3 ports. *EXNIC2.EXE* (111K) gives the NIC 3 sessions, 1 virtual circuit and 1 port. *EXNICS.XFM* (50K) is designed for 3 sessions while using a minimum amount of workstation memory; it provides no virtual circuits or ports.

IBM Token Ring Network PC Adapter I

The IBM Token Ring Adapter I is controlled by the personal computer's microprocessor, based on a driver program resident in the PC's memory. The estimated memory that the personality files take in the workstation, not counting DOS or applications, is shown in parentheses below.

Three programs combine the IBM Adapter hardware driver circuitry with NETBIOS. Each offers different connection capacity as a tradeoff with the amount of memory consumed within the workstation. *RXIBMW.EXE* (128K) gives the IBM Adapter 6 sessions, 1 virtual circuit and 3 asynch ports. *RXIBM2.XFM* (111K) gives the IBM Adapter 3 sessions, 1 virtual circuit and 1 asynch port. *RXIBM3.XFM* (50K) uses the least memory and provides 3 sessions and no virtual circuits or ports.

IBM's Token Ring adapter also requires a file provided by IBM with the adapter called *TOKREUI.COM*, which provides the adapter support interface.

The instructions for setting up the software for each of the adapters is presented in the sections which follow. These sections also describe the personality files in detail.

NIUpc AND 3270 NIUpc CONFIGURATION

The configuration options of the NIUpc and 3270 NIUpc are set with command line parameters and switches associated with the **LOADNIU** and **XNSBIOS** programs. The 3270 NIUpc has an additional program, **PAD.EXE**, which is discussed below.

Basic NIUpc and 3270 NIUpc Command Lines

LOADNIU is run first to initialize and load the NIUpc and 3270 NIUpc, and then **XNSBIOS** is loaded to provide the **NETBIOS** interface. **XNSBIOS** is described later, after the instructions for the NIUpc/TR.

LOADNIU sets up parameters for the NIUpc, and loads the NIUpc's operating software into it. Omitting a parameter will cause the adapter to operate improperly. The syntax of the command is shown in Table A-3. Table A-3 lists the permissible range of each option and the default values used. Table A-4 describes the software modules loaded by **LOADNIU**.

Examples

The following two examples load and initialize an NIUpc. The first example shows the minimal command lines; it uses default values, but note that the **-l:3** and **-P:4** parameters are required to inform **LOADNIU** that it is dealing with an NIUpc:

```
LOADNIU -R -D -P:4 -l:3 EX2NIUW.XFM STDLC  
XNSBIOS
```

The second example shows the default shared memory base address being overridden by a new address at 98000h, and new interrupt **IRQ4**:

```
LOADNIU -R -D -P:4 -l:4 -M:98 EXNIUW.XFM STDLC  
XNSBIOS /M:9
```


Table A-3
LOADNIU Command
(NIUpc and 3270NIU pc)

SYNTAX	
LOADNIU -R [-D] [-M:<memaddr>] -P:<ioaddr> -I:<int> <filename> <lcfile>	
COMMAND LINE ARGUMENTS	
-R	Resets the board and starts diagnostics (required).
-D	Display diagnostics results (optional).
-M:<memaddr>	Sets the shared memory window starting address to match the jumper settings on the NIUpc. Use the first two hex digits of the address, such as 98 , E8 , etc. (optional).
-P:<ioaddr>	Sets the I/O address to match the jumper setting on the NIUpc, and informs LOADNIU that this is an NIUpc (required). 7 = 350h 5 = 360h 6 = 358h 4 = 368h
-I:<int>	Sets the interrupt level to match the jumper setting on the NIUpc. <int> is the number of the interrupt; valid choices are 2, 3, 4, or 5 (required).
<filename>	The name of the software module to be loaded into the NIUpc; see Table A-3 (required).
<lcfile>	The LC file for this NIUpc. Generated by the network manager and based on the network ID number of the NIUpc (required).

Table A-4
NIUpc and 3270 NIUpc
Valid Option Ranges and Defaults

Parameter	Valid Choices	PC	XT	AT
Memory window:	98 = 98000h	■	■	■
	A8 = A8000h	■	■	■
	C8 = C8000h	■	.	■
	D8 = D8000h	■	■	■
	E8 = E8000h	■	■	.
I/O address:	<u>4</u> = 368h	6 = 358h		
	<u>5</u> = 360h	7 = 350h		
Interrupt:	<u>2</u> , <u>3</u> , <u>4</u> , <u>5</u>			
default values are underlined				

Table A-5
NIUpc Software Modules

File	Sessions		Virtual Ports	Circuits	Comment
EXNIUW.XFM	9	1	3		standard workstation software
EXNIU2.XFM	5	2	1		alternative workstation software; used with 3270 PC
EXNIUS.XFM	32	--	--		server software

3270 NIUpc

The 3270 NIUpc uses **LOADNIU** and **XNSBIOS** just like the NIUpc; the command line parameters are the same. However, the 3270 NIUpc requires additional software to implement the micro-to-mainframe circuitry: **PAD.EXE**. **PAD** stays resident in the PC's memory, and forms a bridge between the 3278/79 and IRMA emulation circuitry, and the Net/One interface portions of the adapter. The command line syntax for **PAD** is shown in Table A-6.

Example

This example shows the default load and initialization sequence for a 3270 NIUpc, and an automatic connection network name:

```
LOADNIU -R -D -P:4 -I:3 EX2NIUW.XFM STDLC
XNSBIOS
PAD -I:3 -N:*BIGHOST
```

Table A-6 PAD Command	
SYNTAX	
PAD -I: <net interrupt> [-N: <network name>]	
COMMAND LINE ARGUMENTS	
-I: <net interrupt>	the interrupt used by the Net/One interface portion of the adapter. Valid choices are 3, 4, or 5. (required)
-N: <network name>	the network name to which the adapter will connect automatically (if possible) when PAD is run. (optional)

PERSONAL NIU CONFIGURATION

The configuration options of the Personal NIU are set with command line parameters and switches associated with the **LOADNIU** and **XNSBIOS** programs. These two programs should be run together, **LOADNIU** first and then **XNSBIOS**. **XNSBIOS** is described later, after the instructions for the Token Ring NIUpc.

LOADNIU sets up parameters for the Personal NIU, and loads the NIU's operating software into it. The complete syntax is as follows. Omitting any of the optional parameters (**-M**, **-P**, or **-I**) causes its default to be used. The syntax of the command is shown in Table A-7. Table A-8 lists the permissible range of each option and the default values used. Table A-9 describes the software modules loaded by **LOADNIU**; default values are underlined.

Examples

The following two examples load an Ethernet Personal NIU. The first example shows the minimal command lines (default values are used):

```
LOADNIU -R -D EXNIUW.XFM STDLC  
XNSBIOS
```

The second example shows the default shared memory base address being overridden by a new address at 90000h:

```
LOADNIU -R -D -M:9 EXNIUW.XFM STDLC  
XNSBIOS /M:9
```

Table A-7 LOADNIU Command (Personal NIU)	
SYNTAX	
LOADNIU -R -D [-M:<memaddr>] [-P:<ioaddr>] [-I:<int>] <filename> <lcfile>	
COMMAND LINE ARGUMENTS	
-R	Resets the board and starts diagnostics (required).
-D	Display diagnostics results (optional)
-M:<memaddr>	Sets the shared memory window starting address to match the jumper settings on the NIU. Use the first hex digit of the address, such as 9, E, etc. (Optional)
-P:<ioaddr>	Sets the I/O address to match the jumper setting on the NIU. 0 = 360h 1 = 368h (Optional).
-I:<int>	Sets the interrupt level to match the jumper setting on the NIU. <int> is the number of the interrupt; valid choices are 2 or 5. (Optional).
<filename>	The name of the software module to be loaded into the NIU; see Table A-2. (Required)
<lcfile>	The LC file for this NIU. (Required).

Table A-8
Personal NIU
Valid Option Ranges and Defaults

Parameter	Valid Choices	PCXT	AT
Memory window:	<u>9</u> = 90000h A = A0000h C = C0000h <u>D</u> = D0000h E = E0000h	■ ■ ■ ■ ■ ■ ■ . ■ ■ ■ ■ ■ ■ .	
I/O address:	<u>0</u> = 360h <u>1</u> = 368h		
Interrupt:	<u>2</u> <u>5</u>		
default values are underlined			

Table A-9
Ethernet Personal NIU Software Modules

File	Sessions	Virtual Ports	Circuits	Comment
EXNIUW.XFM	9	1	3	standard workstation software
EXNIU2.XFM	5	2	1	alternative workstation software; used with 3270 PC
EXNIUS.XFM	32	--	--	server software

NIUpc/TOKEN RING CONFIGURATION

The configuration options of the NIUpc/Token Ring are set with the **LOADNIU** and **XNSBIOS** programs, in the same manner as the NIUpc.

The software module file names, I/O addresses, and interrupt options for using **LOADNIU** to configure a NIUpc/Token Ring are different from those used for the NIUpc. Note, in particular, that there are two filenames specified in the command line. The complete syntax is shown in Table A-10. Omitting either of the optional parameters (**-M** or **-I**) causes its default to be used.

Table A-11 lists the permissible range of each option; default values are underlined. Table A-12 lists the files which can be loaded by **LOADNIU**.

Examples

The following two examples load a NIUpc/Token Ring. The first example shows the minimal command lines (default values are used):

```
LOADNIU -R -D -P:2 TRMAC.XFM RXNIU2.XFM STDLC  
XNSBIOS /P:2
```

The second example shows the default I/O port address being overridden to 360h:

```
LOADNIU -R -D -P:8 TRMAC.XFM RXNIUW.XFM STDLC  
XNSBIOS /P:8
```

Table A-10
LOADNIU Command
(NIUpc/Token Ring)

SYNTAX	
LOADNIU -R -D [-M:<memaddr>] -P:<ioaddr> [-I:<int>] TRMAC.XFM <filename> <lcfile>	
COMMAND LINE ARGUMENTS	
-R	Resets the board and starts diagnostics (required)
-D	Displays diagnostics results (required)
-M:<memaddr>	Sets the shared memory window starting address to match the jumper settings on the NIU. Use the first hex digit of the address set, such as 9, E, etc. (optional).
-P:<ioaddr>	Sets the I/O address to match the jumper setting on the NIU. 8 = 360h 2 = 368h (required).
-I:<int>	Sets the interrupt level to match the jumper setting on the NIU. <int> is the number of the interrupt. (optional)
TRMAC.XFM	Primary software loaded into the Token Ring NIU. The next filename is loaded "on top of" <i>TRMAC.XFM</i> . (required)
<filename>	The name of the second software module to be loaded into the NIUpc/Token Ring; see Table A-8. (required)
<lcfile>	The LC file for this NIU. (required)

Table A-11
NIUpc/Token Ring
Valid Option Ranges and Defaults

Parameter	Valid Choices	PC	XT	AT
Memory window:	<u>9</u> = 90000h	■	■	■
	<u>A</u> = A0000h	■	■	■
	<u>C</u> = C0000h	■	.	■
	<u>D</u> = D0000h	■	■	■
	<u>E</u> = E0000h	■	■	.
I/O address:	<u>8</u> = 360h			
	<u>2</u> = 368h			
Interrupt:	<u>2</u> , 3, or 4	■	■	■
	<u>5</u>	■	.	■
default values are underlined				

Table A-12
NIUpc/Token Ring Software Modules

File	Sessions	Virtual Ports	Circuits	Comment
RXNIUW.XFM	9	1	3	standard workstation software
RXNIU2.XFM	5	2	1	alternative workstation software; used with 3270 PC
RXNIUS.XFM	32	--	--	server software

XNSBIOS COMMAND

XNSBIOS loads the **NETBIOS** session layer interface support for the **NIUpc**, **3270 NIUpc**, and **Personal NIU**. **XNSBIOS** remains resident in the PC's memory after it has been loaded; it occupies 7,216 bytes of RAM.

XNSBIOS uses three of the same parameters as the **LOADNIU** command discussed above: memory window, I/O address, and interrupt. The syntax of the command is shown in Table A-13.

CAUTION

The memory, I/O, and interrupt parameters must match on the **LOADNIU** and **XNSBIOS** command lines. That is, each **-M**, **-P**, and **-I** parameter in a **LOADNIU** command line must have a corresponding **/M**, **/P**, and **/I** parameter in an **XNSBIOS** command line.

Table A-13
XNSBIOS Command

SYNTAX

XNSBIOS [/M:<memaddr>] /P:<ioaddr> [/I:<int>]

COMMAND LINE ARGUMENTS

/M:<memaddr> Sets the shared memory window starting address to match the jumper settings on the NIU. (opt)

/P:<ioaddr> Sets the I/O address to match the jumper setting on the adapter.
NIU: NIUpc/Token Ring:
0 = 360h 8 = 360h
1 = 368h (opt) 2 = 368h (req)

NIUpc and 3270 NIUpc:
7 = 350h 5 = 360h
6 = 358h 4 = 368h (req)

/I:<int> Sets the interrupt level to match the jumper setting on the NIU. (opt)

NOTE The XNSBIOS command line parameters may be prefaced by a dash ("-") instead of a right slash ("/").

NIC CONFIGURATION

The NIC does not use an onboard microprocessor; it is controlled by the personal computer's CPU. For this reason its software is loaded into the computer's memory, and remains there afterwards to support the NIC.

Software Module Options

One of three software modules must be loaded into the computer's memory to support the NIC. These software modules support different workstations; the various modules trade off memory requirements versus the number of sessions, ports, and virtual circuits they support. Table A-14 lists these features of the files.

The form of the command line is shown in Table A-15. Each software module is loaded with three optional parameters; omitting a parameter causes the default value to be used, as shown in Table A-16.

Note that if an LC file name is not specified, the NIC reads its own network address, and then looks for a standard LC file with the address contained in the filename. For example:

`18990A.LC`

If the NIC is unable to find this file, it will display an error message to the effect that it is unable to open the LC file.

Table A-14
Ethernet NIC Software Modules

File	Sess	Ports	Vrt Ckts	Memory (bytes)	Comment
EXNICW.XFM	6	1	3	127,776	standard workstation software
EXNIC2.XFM	3	1	1	110,128	alternative workstation software
EXNIC3.XFM	3	0	0	49,296	alternative workstation software

Table A-15
EXNICW, EXNIC2, EXNIC3 Commands
(NIC)

SYNTAX	
{EXNICW} {EXNIC2} [-M:<memaddr>] [-I:<int>] [<filename>] {EXNIC3}	
COMMAND LINE ARGUMENTS	
-M:<memaddr>	Sets the shared memory window starting address to match the jumper settings on the NIC. Use the first two hex digits of the address desired, such as D0, D8, etc. (Optional)
-I:<int>	Sets the interrupt level to match the jumper settings on the NIC. (Optional)
<filename>	The name of the LC file to use (Optional)

Example

The following two examples load a NIC. The first example shows the minimal command lines (default values are used):

EXNIC2

The second example shows the default interrupt number being overridden to 7, and the LC file specified as *STDLC*:

EXNICW -I:7 STDLC

Table A-16 NIC Valid Option Ranges and Defaults				
Parameter	Valid Choices	PC	XT	AT
Memory window:	<u>90</u> = 90000h	■	■	■
	<u>98</u> = 98000h	■	■	■
	<u>A0</u> = A0000h	■	■	■
	<u>A8</u> = A8000h	■	■	■
	<u>C0</u> = C0000h	■	■	■
	<u>C8</u> = C8000h	■	.	■
	<u>D0</u> = D0000h	■	■	■
	<u>D8</u> = D8000h	■	■	■
	<u>E0</u> = E0000h	■	■	.
	<u>E8</u> = E8000h			.
Interrupt:	<u>2</u> , 3, 4, or 7	■	■	■
	5	■	.	■
default values are underlined				

IBM TOKEN RING NETWORK PC ADAPTER I

The IBM Token Ring Network PC Adapter I is configured using two files: *TOKREUI.EXE* (supplied by IBM with the adapter); and one of three other files supplied by Ungermann-Bass: *RXIBMW.EXE*, *RXIBM2.EXE*, or *RXIBM3.EXE*. These three files remain resident in the PC's memory to service the adapter. Each file trades off memory versus session, port, and virtual circuit capabilities, as shown in Table A-20.

TOKREUI Command

TOKREUI's command line parameters allow you to override the node ID number set in PROM on the adapter, and to change the default 8K memory window address. The syntax of the command is shown in Table A-17. Permissible values for the memory window base address are shown in Table A-19.

CAUTION

The `<memaddr>` parameter, if used, must match on both the TOKREUI and RXIBMx command lines. If it is omitted, both programs will use D8000h.

RXIBMx Software Options

One of three files must be loaded after TOKREUI. Each file has a command line parameter specifying the 8K memory window, as shown in Table A-18; permissible values are listed in Table A-19. Table A-20 lists the characteristics of these files.

Table A-17
TOKREUI Command
(IBM Token Ring PC Adapter I)

SYNTAX

TOKREUI [<nodeID>][,<memaddr>]

COMMAND LINE ARGUMENTS

<nodeID>	the new node ID used to override the ID in PROM.
<memaddr>	the memory address window. The parameter consists of the first two hex digits of the window base address; e.g., C0, C4, C8, etc.

Table A-18
RXIBMW, RXIBM2, RXIBM3 Commands
(IBM Token Ring PC Adapter I)

SYNTAX

{RXIBMW}
{RXIBM2} -M:<memaddr>
{RXIBM3}

COMMAND LINE ARGUMENTS

<memaddr>	the memory address window. The parameter consists of the first two hex digits of the window base address; e.g., C0, C4, C8, etc.
------------------------	--

CAUTION

The <memaddr> parameter, if used, must match on both the TOKREUI and RXIBMx command lines. If it is omitted, both programs will use D8000h.

Table A-19
IBM Token Ring Network Adapter
Valid Option Ranges and Defaults

Parameter	Valid Choices	PC	XT	AT
Memory window:	90 = 90000h	■	■	■
	94 = 94000h	■	■	■
	98 = 90000h	■	■	■
	9C = 9C000h	■	■	■
	A0 = A0000h	■	■	■
	A4 = A4000h	■	■	■
	A8 = A8000h	■	■	■
	AC = AC000h	■	■	■
	C0 = C0000h	■	■	■
	C4 = C4000h	■	■	■
	C8 = C8000h	■	.	■
	CC = CC000h	■	.	■
	D0 = D0000h	■	■	■
	D4 = D4000h	■	■	■
	<u>D8 = D8000h</u>	■	■	■
	DC = DC000h	■	■	■
	E0 = E0000h	■	■	.
	E4 = E4000h	■	■	.
	E8 = E8000h	■	■	.
	EC = EC000h	■	■	.
Interrupt:	2			
(jumper setting)	<u>5</u>			
default values are underlined interrupt jumper settings shown for reference				

Example

The following two examples load an IBM Token Ring Network PC Adapter. The first example shows the minimal command lines (default values are used):

**TOKREUI
RXIBM3**

The second example shows a new node ID and shared memory window overriding the default values:

**TOKREUI 4960111,9C
RXIBMW -M:9C**

**Table A-20
IBM Token Ring PC Adapter I Software Modules**

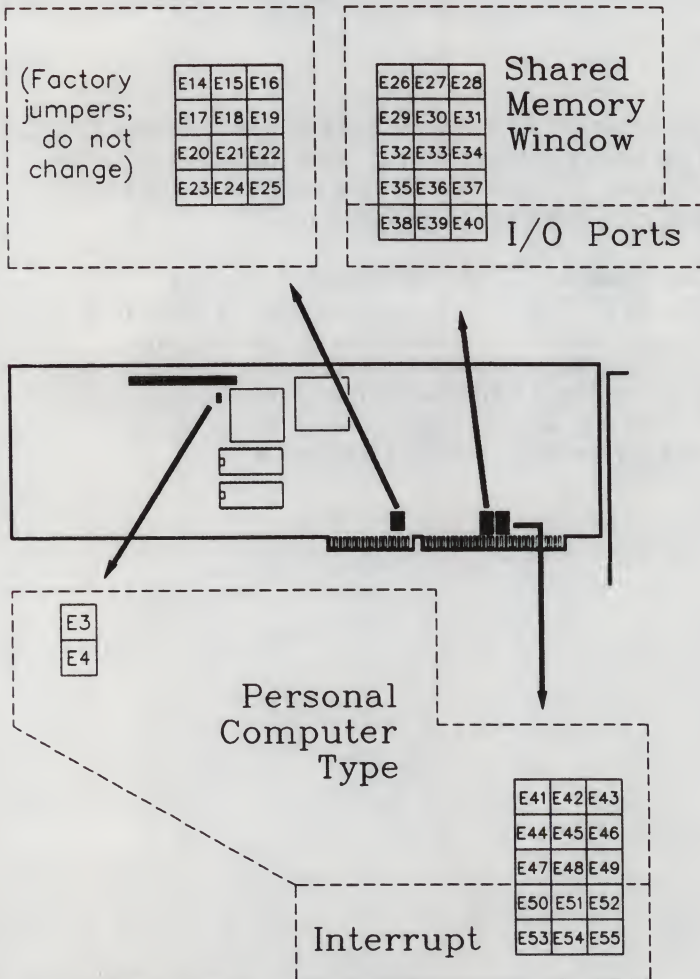
File	Sess	Ports	Vrt Ckts	Memory (bytes)	Comment
RXIBMW.XFM	6	1	3	127,776	standard workstation software
RXIBM2.XFM	3	1	1	110,128	alternative workstation software
RXIBM3.XFM	3	0	0	49,296	alternative workstation software

APPENDIX B

TOKEN RING PERSONAL NIU MODEL 2561A

The Personal NIU/Token Ring adapter, Model 2561A, is no longer manufactured. This appendix provides reference information on this adapter in the event that your installation includes it.

This appendix covers the jumper locations (Figure B-1) and the jumper settings (Figure B-2) for this adapter. Information on its software command lines (**LOADNIU**), and its personality (*.XFM*) files is included following the jumper information. The information in Chapter 6 on Token Ring installation applies to this adapter as well.



JUMPERS

Model 2561A

Token Ring

Personal NIU

Figure B-1

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
80000-
8FFFFh

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
90000-
9FFFFh

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
A0000-
AFFFFh

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
B0000-
BFFFFh

Shared
Memory
Window

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
C0000-
CFFFFh

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
D0000-
DFFFFh
(DEFAULT)

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
E0000-
EFFFFh

E26 ■ ■ E28
E29 ■ ■ E31
E32 ■ ■ E34
E35 ■ ■ E37
F0000-
FFFFFFh

E38 ■ ■ E40
E39 ■ ■
360-
367h

E38 ■ ■ E40
E39 ■ ■
368-
36Fh
(DEFAULT)

I/O Port

E3 ■ ■ E4
PC, XT

E3 ■ ■ E4
AT

Host Type

E41 ■ ■ E43
E44 ■ ■ E46
E47 ■ ■ E49

E41 ■ ■ E43
E44 ■ ■ E46
E47 ■ ■ E49

E50 ■ ■ E52
E53 ■ ■ E55
IRQ2
(DEFAULT)

E50 ■ ■ E52
E53 ■ ■ E55
IRQ3

Interrupt

E50 ■ ■ E52
E53 ■ ■ E55
IRQ4

E50 ■ ■ E52
E53 ■ ■ E55
IRQ5

Token Ring Personal NIU (Model 2561A) Jumper Settings

Figure B-2

TOKEN RING PERSONAL NIU CONFIGURATION

The configuration options of the Token Ring Personal NIU are set with the **LOADNIU** and **XNSBIOS** programs, in the same manner as the Ethernet Personal NIU.

The software module file names, I/O addresses, and interrupt options for using **LOADNIU** to configure a Token Ring Personal NIU are different from those used for the Ethernet Personal NIU. Note, in particular, that there are two filenames specified in the command line. The complete syntax is as follows.

**LOADNIU -R -D [-M:<memaddr>] -P:<ioaddr> [-I:<int>]
TRMAC.XFM <filename> <lcfile>**

The **LOADNIU** command line parameters have the following meanings. Omitting either of the optional parameters (**-M** or **-I**) causes its default to be used.

- | | |
|---------------------------|--|
| -R | Resets the board and starts diagnostics (Required) |
| -D | Displays diagnostics results (Required) |
| -M:<memaddr> | Sets the shared memory window starting address to match the jumper settings on the NIU. Use the first hex digit of the address set, such as 9, E, etc. (Optional). |
| -P:<ioaddr> | Sets the I/O address to match the jumper setting on the NIU.
8 = 360h
2 = 368h
(Required). |
| -I:<int> | Sets the interrupt level to match the jumper setting on the NIU. <int> is the number of the interrupt. (Optional) |

TRMAC.XFM

Primary software loaded into the Token Ring NIU. The next filename is loaded "on top of" *TRMAC.XFM*.
(Optional)

<filename>

The name of the second software module to be loaded into the Token Ring NIU; see Table B-4.
(Required)

<lcfile>

The LC file for this NIU. (Required)

Table B-3 below lists the permissible range of each option; default values are underlined.

Table B-1 Token Ring Personal NIU Valid Option Ranges and Defaults				
Parameter	Valid Choices	PC	XT	AT
Memory window:	9 = 90000h	■	■	■
	A = A0000h	■	■	■
	C = C0000h	■	.	■
	<u>D</u> = D0000h	■	■	■
	E = E0000h	■	■	.
I/O address:	<u>8</u> = 360h			
	2 = 368h			
Interrupt:	<u>2</u> , 3, or 4	■	■	■
	5	■	.	■
default values are underlined				

Examples

The following two examples load a Token Ring Personal NIU. The first example shows the minimal command lines (default values are used):

**LOADNIU -R -D -P:2 TRMAC.XFM RXNIU2.XFM STDLC
XNSBIOS /P:2**

The second example shows the default I/O port address being overridden to 360h:

**LOADNIU -R -D -P:8 TRMAC.XFM RXNIUW.XFM STDLC
XNSBIOS /P:8**

**Table B-2
Token Ring Personal NIU Software Modules**

File	Sessions	Virtual Ports		Circuits	Comment
RXNIUW.XFM	9	1	3		standard workstation software
RXNIU2.XFM	5	2	1		alternative workstation software; used with 3270 PC
RXNIUS.XFM	32	--	--		server software

APPENDIX C

INSTALLATION RECORD FORM

INTRODUCTION

This Appendix contains a form you can use to record pertinent installation information:

- computer identification (computer name, location, user, or whatever system you use);
- network address;
- type of network interface adapter installed.

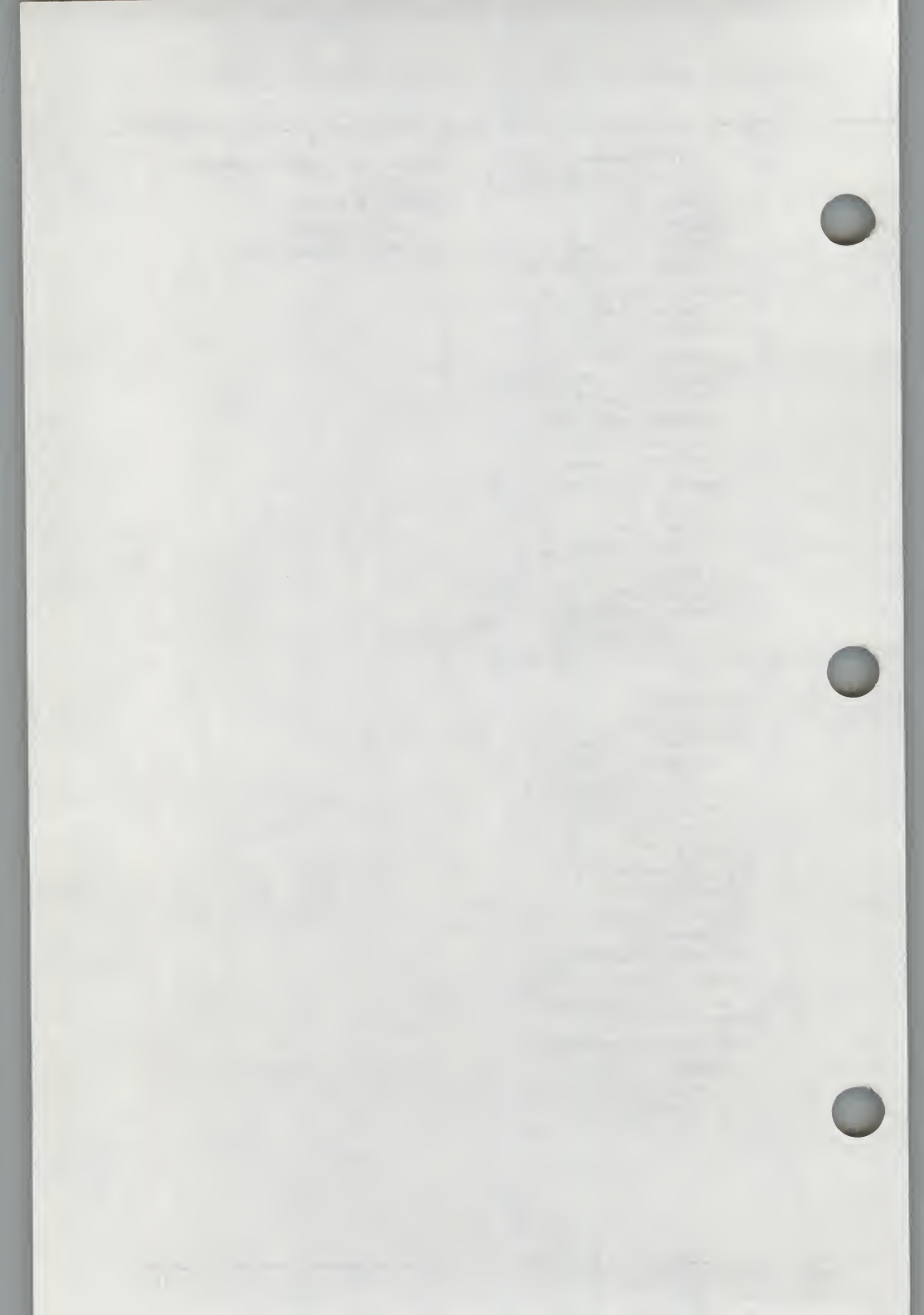
You may reproduce this form for this purpose.

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Net/One®

Connection Manager

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The Connection Manager is a pop-up window utility that provides a simple and efficient interface to Net/One for the Personal Connection user. The Connection Manager provides:

- 1) an asynchronous terminal emulator for accessing Net/One resources;
- 2) the ability to redirect standard **LPT** and **COM** output to a network device;
- 3) a display of basic network information.

The Connection Manager runs on IBM PC, XT, AT, and compatibles, operating on a Net/One Personal Connection network. It runs equally well on baseband or broadband Ethernet networks, and token ring networks.

The Connection Manager is designed to work with a variety of PC display technologies, including:

- IBM monochrome adapter
- IBM color graphics adapter
- IBM enhanced graphics adapter
- Hercules monochrome adapter.

Third party cards that are fully compatible with these products can be expected to operate successfully with the Connection Manager. Appendix A covers some additional information you may need when running the Connection Manager in conjunction with graphics applications.

PROGRAM FEATURES

- Basic Net/One terminal emulator
- Redirection of **COM** and **LPT** output to a network device
- Network statistics and **NETBIOS** name display
- Eliminate need to exit application to make or break network connection
- Memory resident for access at any time, even in the middle of **DOS** applications

This section provides instructions for installing the Connection Manager.

There are two situations where you will be using the Connection Manager. The first is with the Personal Connection version of Microsoft Networks. The second is with the Net/One BNS/PC Interface (Basic Network Software for the Personal Connection). The Connection Manager functions the same way in both environments.

In most cases, your network manager probably will have installed the Connection Manager. If that is true, this section can be bypassed. If not, please review this chapter.

SYSTEM REQUIREMENTS

Hardware

In order to use the Connection Manager, your workstation must be compatible with the IBM PC, PC/XT, or PC/AT. In addition, your workstation must have one Personal Connection network card. For Net/One Ethernet networks, this would be either a Personal NIU or Personal NIC. For Net/One Token Ring networks, this could be the Ungermann-Bass Personal NIU TR or the IBM Token Ring Network PC Adapter I.

Since the Connection Manager is memory resident, your personal computer will require approximately 18 Kbytes of RAM in addition to your current networking requirements. You will also need the same amount of space on your boot disk to store the Connection Manager files.

Microsoft NetworksSoftware

Your workstation must be using both DOS 3.1 or above, and Microsoft Networks Release 14.0 or above in order to operate with the Connection Manager.

INSTALLING THE MAIN CONNECTION MANAGER FILES

The main Connection Manager files are distributed with the Microsoft Networks Manager License and the BNS/PC Software. When your Personal Connection network software is installed on your personal computer, the main Connection Manager files are usually installed as well.

Listed below are the primary files related to the use of Connection Manager:

- NETCICOM.DRV** The main Connection Manager file.
- NETREDIR.COM** A utility that enables you to redirect COM and LPT output to the network without having to invoke the Connection Manager. This utility is designed to run in a batch file.
- KBFIX.COM** A utility that enables the Connection Manager to run in a personal computer that has installed one of the DOS KEYBxx utilities in order to support international PC keyboards. If you use any of the KEYBxx utilities (ie., KEYBUK.COM, KEYBGR.COM, etc.), you will need this utility.

The instructions below assume that the Connection Manager files are already located on your PC. If they are not, then you should ask your network manager to obtain them.

1. First, check to see if the Connection Manager file has been installed on your personal computer.

Floppy disk systems: Put your boot disk into drive A and type:

DIR A:NETCICOM

Fixed disk systems: Type:

DIR C:\NETWORK\NETCICOM

Both commands give similar results. If you have the Connection Manager file on your personal computer, it will respond with:

NETCICOM DRV 18784 5-05-86 10:16p

If the Connection Manager file is not installed, your personal computer will respond with:

file not found

If the Connection Manager is available, proceed to step 3. If it is not, go to step 2.

2. Contact your network manager and ask for the following files:

NETCICOM.DRV
NETREDIR.COM
KBFIX.COM (optional)

When you have received these files, copy them over to your personal computer. This can be done by connecting to a Microsoft Networks server directory that has these files or by getting a diskette with these files on it:

Floppy disk systems:

When you are getting the files from a network server, place your boot disk in drive A: and type:

COPY x:NETCICOM.DRV A:

COPY x:NETREDIR.COM A:

COPY x:KBFIX.COM A:
(optional)

where x: is the redirected drive to the server directory.

When you are getting the files from a diskette in drive B:, place your boot disk in drive A: and type:

COPY B:NETCICOM.DRV A:

COPY B:NETREDIR.COM A:

COPY B:KBFIX.COM A:
(optional)

Fixed disk systems:

When you are getting the information from a network server, type:

COPY x:NETCICOM.DRV A:

COPY x:NETREDIR.COM A:

COPY x:KBFIX.COM A:
(optional)

where x: is the redirected drive to the server directory.

When you are getting the information from a diskette in drive A:, type:

COPY A:NETCICOM.DRV C:\NETWORK

COPY A:NETREDIR.COM C:\NETWORK

COPY A:KBFIX.COM C:\NETWORK
(optional)

3. In order to have the Connection Manager installed when your system boots up, you will need to edit one file, *CONFIG.SYS*.

CONFIG.SYS specifies to your personal computer to load the Connection Manager every time your system boots. *CONFIG.SYS* must be located on your boot disk's root directory.

You will need to use a standard text editor that can edit ASCII files. If you don't have an ASCII text editor, the DOS line editor, *EDLIN*, can be used. Consult your DOS documentation on how to use *EDLIN*.

Find the system below that describes your configuration. Add the line following to the *CONFIG.SYS* file.

Floppy disk systems:

DEVICE = NETCICOM.DRV [8]

Fixed disk systems:

DEVICE = C:\NETWORK\NETCICOM.DRV [8]

where [8] is an optional switch to be used when it is necessary to display foreign character sets. This will add support for the Connection Manager's terminal emulator to display foreign characters.

NOTE In order for foreign characters to be displayed, the NIU ports to which the user will be connected must be set up to support a full 8-bit data path. If this is not done, garbage data will be displayed on the screen. Contact your network manager for proper support of the Net/One NIU's to support foreign character sets.

Once you have made the changes to your *CONFIG.SYS* file you will need to reboot your system to have these changes take effect.

Usage of all three Connection Manager files referenced here will be discussed in following chapters.

USING THE CONNECTION MANAGER

INTRODUCTION

This section describes the basic usage of the Connection Manager:

- Invoking the Connection Manager
- Using the terminal emulator
- Redirecting **COM:** and **LPT:** output to a Net/One device
- Displaying network statistics and NETBIOS names currently in use

CALLING UP THE CONNECTION MANAGER

Whenever your system is booted, the Connection Manager is installed in the main memory of your personal computer. This means that it is always available, even when you are in the middle of any PC application.

The Connection Manager operates using a pop-up window user interface. Once called up, the main window is always displayed in the same location, in a window that "pops-up" on your display.

To call up the Connection Manager window, press the following three keys **simultaneously**:

Ctrl **Alt** **R-shift**

(**R-shift** is the right shift key on your keyboard; the left key will not work.)

It pops up a window on your display, in the upper right section of the screen, which looks like Figure 3-1.

The main window has two parts:

- the upper three-fourths is a menu; it lists three keystroke combinations that call up other windows, and the keystroke combination that returns you to your application program.
- the lower quarter of the main window is a small terminal emulator (you can also call up a full-screen terminal emulator, described below).

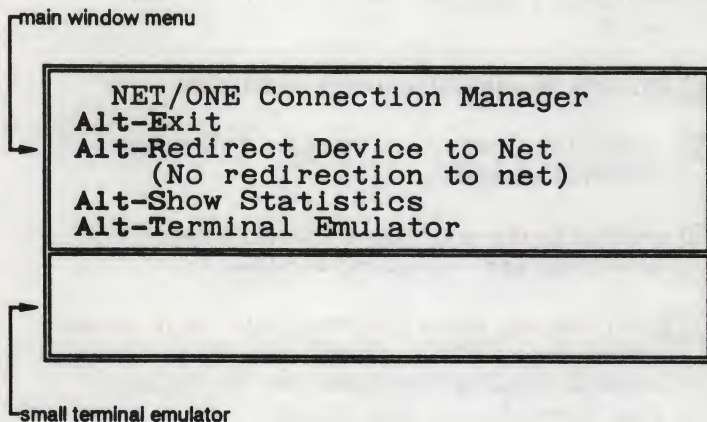


Figure 3-1 : Connection Manager Main Window

NAVIGATING THROUGH THE CONNECTION MANAGER

From the main window you can call up secondary windows using various keys in combination with the **Alt** key (the functions they call up are explained later in this chapter):

AltE Exits from the Connection Manager back to your application (works from any window).

AltR Redirects a local printer device to the network.

AltS Shows a display of network statistics.

AltT enters the Connection Manager full-screen Terminal emulator.

AltC returns to the main Connection Manager window from any secondary window.

NOTE If you hit any keys other than those shown above, they will be passed on to the small-window terminal emulator (see the explanation of the Connection Manager's main window below).

Figure 3-2 is a "map" to help you navigate through the Connection Manager windows. The map looks complicated at first, but its underlying pattern is quite simple. The figure shows four Connection Manager windows, and an application. The various lines indicate which keys move you between which windows. Looking at Figure 3-2, you see that most of the lines are labelled either **AltC** or **AltE**. These two keys move you either back to the Connection Manager's main window from a secondary window, or back to your application. The remaining keys move you from the main window to the secondary windows.

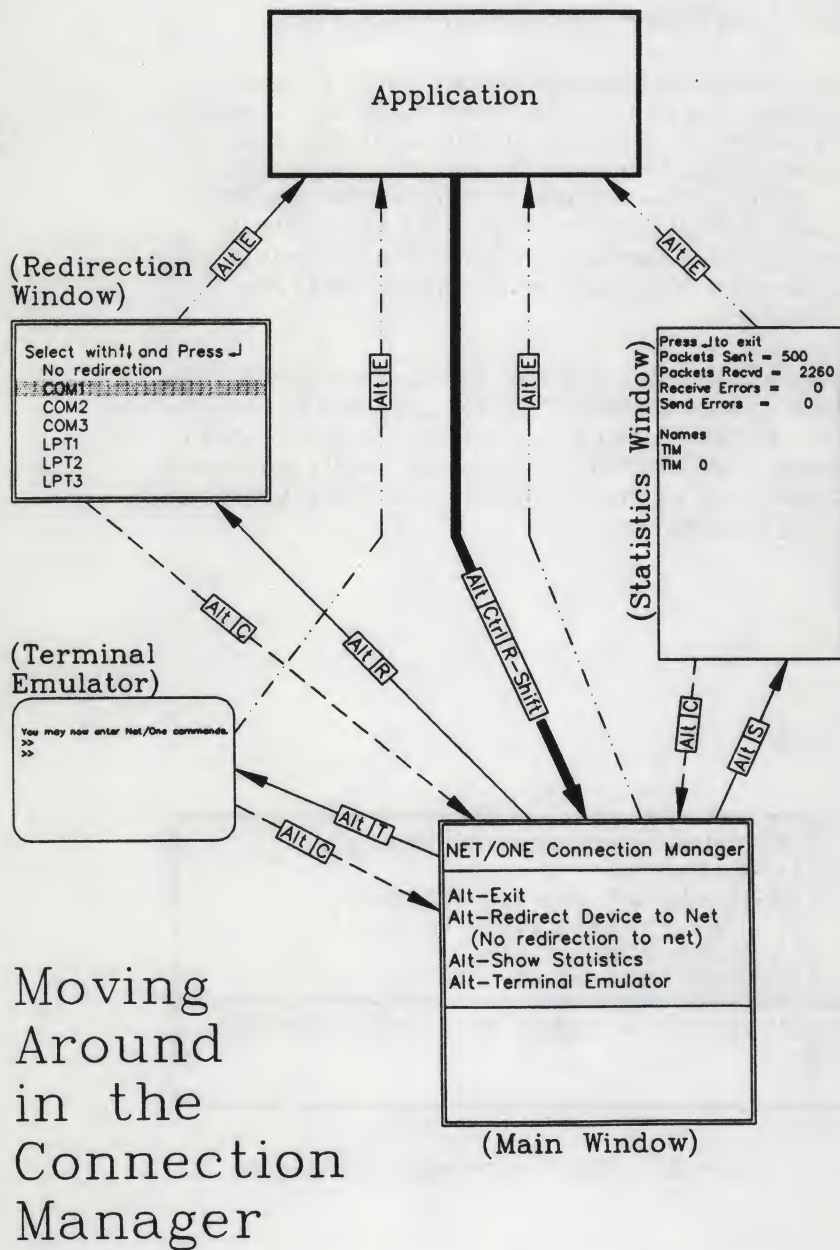


Figure 3-2

SMALL WINDOW TERMINAL EMULATOR

The Connection Manager has two terminal emulator windows. A full screen terminal emulator is available through one of the main window menu selections. A second terminal emulator is built into the bottom of the main window. This terminal window can display 3 lines of 34 characters. Figure 3-3 highlights the small terminal emulator (it is the window that displays the message "You may now enter Net/One commands").

This small window is useful for simple Net/One commands such as **CONNECT** (in fact, the size of the window was determined by the amount of text needed to display with **CONNECT**). When you need a full-screen terminal, the Connection Manager offers you one with its **Alt-T** option.

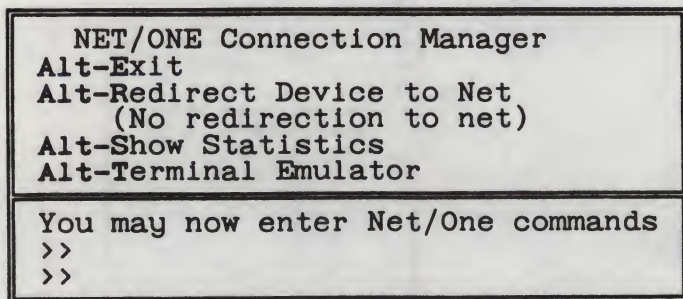


Figure 3-3 : Main Window Terminal Emulator

EXITING FROM THE CONNECTION MANAGER

To return to your application program (or DOS) from any Connection Manager window, press:

Alt E

This will clear the Connection Manager window and redisplay whatever was on the screen before you used the Connection Manager. You can then continue with your application.

THE SECONDARY WINDOWS

The Connection Manager's main window menu offers you five options. These consist of three secondary windows, a small terminal emulator (part of the main window), and the option of returning to your suspended application program.

You exit to your application and invoke the three secondary windows by pressing **Alt** keys. If you press any other keys than these, the characters you type are sent immediately to the terminal emulator (and will show up in the small terminal emulator window).

These options are:

Alt Exit

returns to your application program from the Connection Manager.

Alt Redirect Device to Net

Allows DOS device output to be sent to a Net/One attached device.

Alt Show Statistics

Displays the current network send and receive data statistics, along with the network names your personal computer is using.

Alt Terminal Emulator

Turns your personal computer into a Net/One asynchronous terminal, enabling you to connect to asynchronous resources available through Net/One, such as a modem pool or a minicomputer port.

Each of these functions is described below.

"Redirect Device to Net"

The Connection Manager enables you to send output from your personal computer to a network attached device, such as a printer. The word "redirect" implies that instead of your computer sending information to device attached directly to it, the information will be re-directed to a network attached device.

For example, let's say that your work group has a serial plotter that you need to use with certain graphics applications. This plotter is attached to a Net/One NIU port. By connecting to that printer (done with the terminal emulator described below) and redirecting your COM1: output to the network, you can send data directly to the plotter from the graphics application.

The Connection Manager enables you to send information from up to six DOS devices, COM1:, COM2:, COM3:, LPT1:, LPT2:, and LPT3:, out to the network.

To redirect one of these DOS devices to the net, you must first establish a connection to the device using the Net/One **CONNECT** command (explained in detail in Chapter 5). Then move to the Connection Manager's redirection window by pressing: **[Alt][R]**.

A second window will be overlaid on the first. This allows you to choose which of the six DOS devices you wish to redirect. Only one redirection can be done at a time. Another option enables you to turn off any redirection. Figure 3-3 shows the Redirection window.

To redirect a device, move the cursor up or down with the cursor arrow keys. Then select your choice by pressing **[Enter]**.

To delete a redirection, move the cursor to the bar noting "No redirection" and press **[Enter]**. This will discontinue redirection of the DOS device to the network.

The Connection Manager main window displays the device (if any) which has been redirected to the network. This is shown in parentheses in the main window:

Alt-Redirect Device to Net
(No redirection to net)

means that there is no current redirection, whereas

Alt-Redirect Device to Net
(COM1: redirected to net)

shows that **COM1:** is being redirected out to the network.

To return to the Connection Manager main window press: **Alt** **C**. To return to your application program press: **Alt** **E**.

For a brief technical explanation of how the Connection Manager implements redirection to the network, see Appendix B.

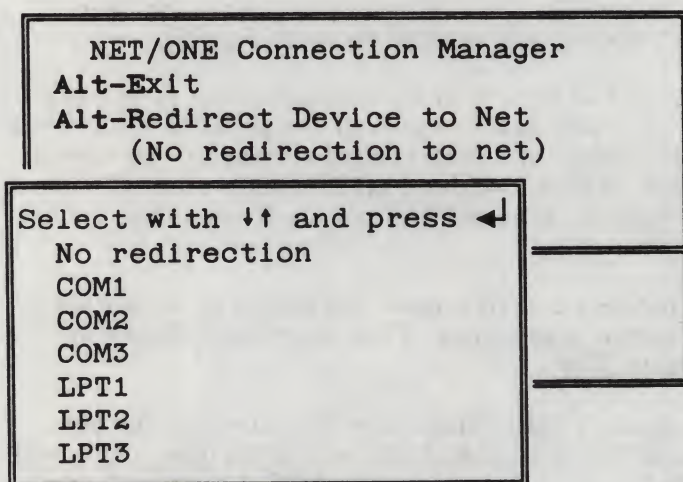


Figure 3-4 : Redirection Window

"Show Statistics"

The Connection Manager keeps track of network statistics. This includes the number of packets sent and received as well as the number of errors sent and received.

Packets is a network term that is used to describe each block of information that your PC sends or receives to/from another device on the network.

This set of statistics is started each time you boot your PC. The counters are updated in real time, so that when you bring up the Statistics window, you can see the information being changed.

The Statistics window also shows the network names that your computer is using on the network.

To bring up the Statistics window, press:

Alt S

Figure 3-5 shows an example of the Statistics Window.

To return to the Connection Manager main window press: **Alt C**. To return to your application program press: **Alt E**.

```
Press ↵ to exit
Packets Sent   =    500
Packets Recvd  =   2260
Receive Errors =     0
Send Errors    =     0
Names
TIM
TIM              0
```

Figure 3-5: Statistics Window

Full Screen "Terminal Emulator"

The Connection Manager provides a full screen terminal emulator that will connect you to any asynchronous resource on the network. This might include modems, minicomputers, or even mainframes. This, of course, will depend upon what else you have installed on the network.

To start up the full screen terminal emulator, press:

Alt **T**

The Connection Manager's full screen terminal emulates a simplified VT-100 terminal. In full screen terminal emulation mode, 24 lines by 80 columns are displayed.

The bottom line of the full screen terminal emulator is a status line that tells you a number of things. It shows the commands on how to go back to the Connection Manager main window or directly exit out of the Connection Manager.

To return to the Connection Manager main window press: **Alt** **C**. To return to your application program press: **Alt** **E**.

NOTE When you exit the Connection Manager from the full screen terminal emulator, and then re-enter the Connection Manager, you will go directly back into the full screen terminal emulator.

The status line of the full screen emulator can be turned into a line monitor, or can be turned off completely. A line monitor shows the ASCII data stream that is being received from the network and displayed on the screen. Line monitors are generally useful for diagnostic purposes.

The status line is controlled by the **Alt L** key. The first time you press it, the status line becomes a line monitor. The second time you press **Alt L** the status line is turned off. The third time you press **Alt L** the status line is restored.

The terminal emulator communicates with special Net/One software called the network command interpreter. The command interpreter provides a set of commands that are very useful in a network environment. For example, commands are available to allow you to connect to network resources, put sessions on hold, and determine the availability of resources. Chapter 5 provides a complete description of the Net/One commands.

When communicating with some host systems, they often require a break to be sent to disconnect the session. This will also be true when you have turned on binary mode (as explained in Chapter 5). The Connection Manager terminal emulator supports the break function; press:

Ctrl B

NOTE your network must be running Net/One Basic Network Software (BNS) Release 15.0 or greater to support the break function.

The Connection Manager terminal emulation provides very basic emulation of the VT-100 and VT-52 terminals. This emulation of these two terminals is explained more fully in Appendix C.

If you are not getting any response from the terminal emulator, you should contact your network administrator.

NOTE When the terminal emulator does not work on the Connection Manager, it is either because the LC file has not been configured to support the Net/One command interpreter, or the wrong network software has been used. Consult the Microsoft Networks Manager's Guide or the Software Install division of the BNS/PC Interface Manual for which network software file to use.

Both the small and the full screen terminal emulators use the same buffer area in your PC. What this means is that when you switch back and forth between the main window terminal and the full screen one, you will be seeing the same data.

OTHER CONNECTION MANAGER FUNCTIONS

The Connection Manager provides two other utilities, to support additional functions and configurations. This chapter discusses these two utilities, **NETREDIR** and **KBFIX**.

NETREDIR

NETREDIR.EXE allows you to redirect a DOS device to Net/One without having to enter the Connection Manager window. This is especially helpful if you want to set up this redirection in a batch file, such as *AUTOEXEC.BAT*. In some situations, you may not want to have the Connection Manager installed in your main memory each time your PC boots.

You can use another Net/One terminal emulator (such as PCTerm or Crosstalk) to set up the connection for the redirected device, and then use **NETREDIR** to actually redirect the device to the network.

To use **NETREDIR**, enter the command:

NETREDIR <device>

where device is the DOS device you want to redirect: **COM1, COM2, COM3, LPT1, LPT2, LPT3**. You can type this command at the DOS prompt, or use it in a batch file.

For example, to redirect any data sent to **COM2** to the network, use the command:

NETREDIR COM2

NETREDIR will confirm the redirection with the message:

com2: is redirected to the network

Any time you bring up the Connection Manager window, it will display a note showing any redirection you have made using **NETREDIR**.

To change the redirection to the network to another device, use the **NETREDIR** command again with the new device.

To cancel redirection altogether, type:

NETREDIR NONE

or

NETREDIR 0

You will see the message:

COM not redirected to network

which means no redirections to the network are in use. This message applies to both **COM** and **LPT** devices.

KBFIX

KBFIX.EXE is a utility that enables the DOS **KEYBxx** utilities to be used in conjunction with the Connection Manager. The DOS **KEYBxx** utilities support foreign keyboards for personal computers.

The way that the **KEYBxx** utilities release control of the keyboard to other memory resident functions is very different than the way that DOS allows keyboard control. Therefore, without this utility, the Connection Manager cannot be used along with one of the **KEYBxx** utilities. With **KBFIX**, both can be used without problem.

[NOTE] **KBFIX** will only work satisfactorily with fully compatible PC, XT and AT machines. It may not work with personal computers that are not 100% compatible.

To use **KBFIX**, you will need to edit your **AUTOEXEC.BAT** file. It is very important that you place **KBFIX** and **KEYBxx** in the proper place in the **AUTOEXEC.BAT** file.

The two key guidelines to using **KBFIX** and **KEYBxx** are given below:

1. The **KEYBxx** utility must be loaded first.
2. **KBFIX** must be loaded before the network card is loaded.

The usage of **KBFIX** is shown below in the sample **AUTOEXEC.BAT** file for a fixed disk system.

```
echo off
c:
path=.;c:\;c:\network;c:\dos;
append=.;
prompt $p$g
keybuk
cd \network
kbfix
net start urdr tom
```

INTRODUCTION

You can issue commands to the *Net/One command interpreter* through either of the Connection Manager's terminal emulators. There are several commands that control virtual circuit connections. You may or may not have all of them, depending upon how your PC is configured.

HOW TO TYPE COMMANDS

Net/One commands contain a combination of alphabetic, numeric, and other characters, such as the carriage return and space. You may type alphabetic characters in either upper or lower case. Certain special characters are represented as:

space	Space Bar
Enter	Carriage Return
Del	Delete
←	Backspace
Ctrl	Control

The last keystroke of each command line must always be a carriage return **Enter**.

GETTING STARTED

Your copy of the Connection Manager will have been configured to have a *wakeup character* which activates the terminal emulator. The default wakeup character is the carriage return. Check with your network manager to find out what your wakeup character is.

Bring up the Connection Manager main window. You have the choice of using the small window emulator which is part of the main window (by doing nothing except typing the wakeup character); or using the full-screen terminal emulator by typing **Alt T**. After you type the wakeup character you will see one of the following messages.

If your PC has been configured to ask for a password, you will see the following:

Please log in to Net/One.

Password:

Type the password that the network administrator has assigned to you. Do not forget to type **Enter** at the end.

NOTE Be careful when you type your password. The password that you type must match exactly the one as signed to your PC. The system checks the case of each letter that you type. For example, the system considers "ABLE" and "able" to be different passwords.

If you type the wrong password or type the password incorrectly, Net/One displays the following message, then prompts you to type the password again.

That is not the password

Password:

After you successfully type the password, or if you did not need to type a password, Net/One displays the following message and command prompt. The command prompt of two right-angle brackets (>>) is your signal to type a command followed by a carriage return.

You may now enter Net/One commands.

>>
>>

THE HELP COMMAND

The network manager assigns commands to a workstation depending upon the activities that a user performs at that workstation. This means that your PC might have a different set of commands than the PC at the next station.

If you do not know which commands have been assigned to your PC, you can query the Net/One help facility to get a list of them. To invoke the help feature, type:

>>H

or

>>?

The help feature displays all the commands that are available on the PC you are using.

We show a sample display on the next page. Yours may differ depending upon which commands are assigned to your PC. See the Command Descriptions section for detailed information on each command.

>>help Enter

The Net/One commands are:

CONNECT Resource Name<CR>
GET Resource Name<CR>
LIST<CR>
RESUME Connection Number<CR>
ABANDON Connection Number<CR>
EXAMINE Resource Name<CR>
IDENTIFY NIU<CR>
SET BINARY ON<CR> or OFF<CR>
SET DISCONNECT /New Disconnect Sequence/<CR>
SET HOLD /New Hold Sequence/<CR>
SET ECHO ON<CR> or OFF<CR>
SET LINEFEEDS ON<CR> or OFF<CR>
QUIT<CR>

and

INTERCONNECT Resource Name 1<CR> Resource Name 2<CR>
DISCONNECT Resource Name<CR>

THE LIST COMMAND

Type the **LIST** command to see a list of the operating characteristics currently assigned to your PC. A sample display is shown below; your display may differ. Turn to the **LIST** entry in the Command Descriptions section for more information. While the display is on the screen, fill out the Device Characteristics table in Appendix F. The values listed are the ASCII representations of the current parameter values.

```
>>list Enter
```

You are using port 1 of Net/One PC-NIU number 19023A, on network number 4.
Port 1's name is "19023A1". PC-NIU 19023A's name is "R.smurffle".

Connection 1 is unused.
Connection 2 is unused.
Connection 3 is unused.

Your Hold Sequence Is: <ESC>OQ
Your Disconnect Sequence Is: <ESC>OP

The Net/One command editing keys are:
Cancel whole line: or ^<BS> Delete last character: <BS> or ^h
Delete last word: <CAN> or ^x Complete current word: <SP>
Repeat last line: <SOH> or ^a

ECHO mode is turned OFF.
Automatic Insertion of linefeeds after carriage returns is turned OFF.

>>

THE SHORT FORM FOR COMMANDS

Net/One recognizes abbreviated command words. You can abbreviate a command word if you type enough characters to distinguish that command from any other. For example, the **CONNECT** command is the only one that begins with a "c", so "**c host2**" is all you need to type to establish a connection to the network resource named "**host2**".

Net/One will complete the command you abbreviate if you enter the command abbreviation followed by the character defined as your PC's *word completion character*. The default completion character is a space. The network manager defines the word completion character when the PC is configured. Use the **LIST** command to find out what key has been assigned as your word completion character.


To connect to "**host2**" using the word completion feature, type the following command line; (the characters you type are underlined, and the characters completed by Net/One are not):



```
>>c space onnect host2 Enter
```



Type the "c" immediately after the command prompt. As soon as you type a space, Net/One completes the word, generates "**onnect**", and adds a space following the completed command word. Next, type the name of the resource to which you wish to connect, "**host2**". Finish the command line by typing a carriage return.

Editing Command Lines

Net/One recognizes three command-editing characters: *cancel last character*, *cancel last word*, and *cancel whole line*. Use them to correct errors you make while typing command lines. Check the LIST display to see which keys have been assigned as the command-editing characters.

Use the cancel last character key to back up one character at a time. The default key is  (backspace).

Use the cancel last word character to erase the previous or the current word. The default is  .

You can cancel the entire command line by pressing the cancel whole line key. The default is  .

IDLE MODE

Use the QUIT command to exit the command interface. This places the terminal in *idle mode*. QUIT also terminates any active connection and all connections on hold. It resets all parameters that you changed with the SET command.

The network manager may assign an idle timeout value to your PC. If this has been done, you may notice that the terminal goes to idle mode spontaneously. This happens when you leave your PC at the Net/One command prompt for longer than the specified timeout value. To establish a connection from idle mode, type your wakeup character to bring back the command prompt.

COMMAND SUMMARY

Table 5-1 on the next page lists the available Net/One commands, and gives a brief description of each. Refer to the detailed command descriptions following the table for more information.

Table 5-1
Net/One Commands

Command	Description
ABANDON	Breaks a circuit that is currently on hold.
CONNECT	Requests a connection to another device or service.
DISCONNECT	Disconnects two resources. Neither one of the resources can be the PC issuing the command.
EXAMINE	Reports the status of a network resource.
GET	Requests a connection to another device or service until the circuit is established.
HELP or ?	Displays a list of all commands available on the PC issuing the command.
IDENTIFY	Displays the name of an NIU given its network address.
INTERCONNECT	Connects two network resources. Neither one of the resources can be the PC issuing the command.
LIST	Lists the names assigned to the PC, status of the connections that are available to the PC, the current values of the editing characters and the Hold and Disconnect sequences, and the status of the linefeed and local echo parameters.
QUIT	Exits the command interface, putting the PC in Idle mode.
RESUME	Reactivates a connection on hold, making it the current active connection.
SET	Lets you temporarily change the Hold or Disconnect sequence and the status of local echo, linefeeds, flow control, and binary mode.

COMMAND DESCRIPTIONS

This section gives a description of each Net/One command, in alphabetical order. Each entry consists of the formal definition of the usage of the command ("syntax"), a description, and examples of the command's use.

The second line of each description notes that the command is a "STANDARD Command" or an "EXTENDED Command". A standard command will always be available. An extended command is available at the discretion of the network administrator; your LC file contains a list of allowed commands for your PC.

If you make a typing error or issue a command that the system does not understand, it responds with two question marks (??). If you receive any other response, refer to Appendix E for system messages for an explanation.

ABANDON

(STANDARD Command)

SYNTAX

ABANDON <connection_number> **[Enter]**

<connection_number> represents the number associated with the virtual circuit that you want to break.

DESCRIPTION

ABANDON terminates the specified virtual circuit that has been on hold. Net/One assigns a sequential number to a circuit at the time it is established. The first connection you establish is connection 1, the second is connection 2, and the third is connection 3. The maximum number of virtual circuits for each device is three. If you have three circuits on hold, and you issue an **ABANDON** command to break connection 2, then issue a **LIST** command, you will see connection 1 and connection 3. To avoid confusion between circuits on hold, Net/One does not move them up to fill numerical gaps. Instead, the next circuit you establish will become connection 2.

EXAMPLE

Use the following command line to terminate the suspended circuit assigned the number 2.

```
>>abandon 2 [Enter]
```

```
Connection number 2 has been abandoned.
```

CONNECT

(STANDARD Command)

SYNTAX

CONNECT <resource_name> **Enter**

<resource_name> can be any of the following identifiers of a device or service to which you want to connect:

- The network address
- The unique name
- A rotated name

Refer to the Asynchronous Communications Service Reference Manual for an explanation of forming addresses and names.

DESCRIPTION

CONNECT creates a virtual circuit between the PC issuing the command and another network resource when that resource is not busy. The named resource can be a device or service.

To terminate a connection that has been established with **CONNECT**, use the Disconnect Sequence instead of the **DISCONNECT** command.

EXAMPLES

Connecting to a resource with a unique name

To connect to a PC with the unique name "RICK'S CRT", use the following command line. Net/One searches only your local network for the named resource.

```
>>connect rick's crt   
Connecting ... (1) 123d5 Success.
```

Connecting to a resource anywhere on the internet

You know of a device "Computer 1" somewhere in the internet. You are not sure whether it is on your local network or on another one. To connect to that device, use the following command line:

```
>>connect *computer 1   
Connecting ... (2) 2345a1 Success.
```

NOTE

Remember that all local networks, including the local network to which the initiating resource is attached, are searched for a named resource when you precede the resource name with an asterisk. Therefore, if you wish to connect to a specific resource on an internet, you must know either its unique name or its exact network address.

DISCONNECT

(EXTENDED Command)

SYNTAX

DISCONNECT <resource_name> **[Enter]**

<resource_name> represents the name or alternative ID for the device or service you wish to disconnect.

DESCRIPTION

DISCONNECT is used to break a connection between two resources that cannot break it themselves. Such resources usually are not able to initiate connections either, and will have been connected by the **INTERCONNECT** command. Use the **EXAMINE** command to check the status of the resources you wish to disconnect. Do not use **DISCONNECT** to break a connection to your own PC.

The connection that you disconnect can be between two resources anywhere in the internetwork system. If one or the other is on another local network, precede its name with an asterisk. However, you must know the unique names of both resources. If you use rotated names, Net/One issues an error message.

DISCONNECT is an extended command. It is available to you only if the network manager has configured it on your PC. Issue a **LIST** command to see if **DISCONNECT** is present.

Do not confuse the **DISCONNECT** command with the Disconnect Sequence. Use the Disconnect Sequence to break a connection between your PC and another resource.

EXAMPLE

To disconnect the resource attached to NIU #23, Board "A", Port 1, from another resource (not from your PC), use the following command line:

```
>>disconnect 23a1[Enter]  
Disconnecting ... Success.  
"crt" [(1) 23A1] has been disconnected.
```

EXAMINE

(EXTENDED Command)

SYNTAX

EXAMINE <resource_name>

<resource_name> represents the name or alternative ID of the device or service whose status you wish to check.

DESCRIPTION

EXAMINE allows you to check the current status (connected, busy, free) of another device or service. This is an extended command and may or may not be available on your PC. Issue a **LIST** command to see if **EXAMINE** is present.

To examine a resource on another local network in the internet, place an asterisk (*) before the resource name in the command line.

EXAMPLE

To examine the status of a device with the name "sue", use the following command line:

```
>>examine sue 
```

```
Examining ... Success.
```

```
"sue" [(1) 543b2] is connected by a command to [(2) 492c8].
```

```
(1) 543b2's other names are "Sue", "Jones" and "Sue Jones".
```

```
(2) 492c8's other names are "host", "computer" and "big host".
```

GET

(STANDARD Command)

SYNTAX

GET <resource_name> Enter

<resource_name> can be any of the following identifiers of a device or service to which you want to connect:

- The network address
- The unique name
- A rotoed name

Refer to the *Asynchronous Communication Service Reference Manual* for an explanation of forming addresses and names.

DESCRIPTION

GET creates a virtual circuit between the PC issuing the command and the named resource as soon as the named resource is not busy. The command continues to attempt creating the requested connection until successful. When the connection is established, Net/One waits until the system prompt (>>) shows on the screen, then displays the following message:

Your connection to <resource_name> is
Open as Connection Number connection number.

When you are ready to use the connection, issue a **RESUME** command to activate the circuit.

The effect of issuing a **GET** command is make a connection and put it on hold. There is no limit to the number of times **GET** attempts to make the connection or to the length of time it goes on trying. If you decide that you want Net/One to stop trying to establish the connection, issue a **LIST** command to find out which connection is on hold. Then use **ABANDON** to terminate the connection.

If you already have three circuits on hold, you cannot issue another **CONNECT** or **GET** command until a circuit is disconnected. If you do, Net/One displays this message:

You cannot make another connection until you
ABANDON one of the ones you have now.

NOTE

Remember that all local networks, including the local network to which the initiating resource is attached, are searched for a named resource when you precede the resource name with an asterisk. Therefore, if you wish to connect to a specific resource on an internet, you must know either the resource's unique name or its exact network address.

EXAMPLES

Connect to a resource with a unique name

To connect to a PC on the same network with the unique name "RICK'S CRT", use the following command line:

```
>>get rick's crt 
```

Connect to a resource anywhere on the internet

You know of a resource named "computer lab". You are not sure whether it is on your local network or not. To connect to that resource, use the following command line:

```
>>get *computer lab 
```

HELP ?

(STANDARD Command)

SYNTAX

HELP

?

DESCRIPTION

HELP lists all the Net/One commands that are available on your PC. Some of the commands shown may not be available to you.

EXAMPLE

>>help

The Net/One commands are:

CONNECT Resource Name<CR>

GET Resource Name<CR>

LIST<CR>

RESUME Connection Number<CR>

ABANDON Connection Number<CR>

EXAMINE Resource Name<CR>

IDENTIFY nlu serial no. or node id<CR>

SET DISCONNECT /New Disconnect Sequence/<CR>

SET HOLD /New Hold Sequence/<CR>

SET ECHO ON<CR> or OFF <CR>

SET LINEFEEDS ON<CR> OR OFF<CR>

QUIT<CR>

and

INTERCONNECT Resource Name 1<CR>Resource Name 2<CR>

DISCONNECT Resource Name<CR>

IDENTIFY

(STANDARD Command)

SYNTAX

IDENTIFY <Node_ID> **Enter**

<Node_ID> is the network address of an NIU; it is a decimal number.

DESCRIPTION

IDENTIFY takes the network address argument and polls that address over the network. If it receives a response it displays the name of the corresponding NIU, and the hexadecimal equivalent of the full network address.

EXAMPLE

To identify an NIU with a serial number of 14632, use the following command line:

```
>>Identify 14632Enter
Checking ... Done
Node ID 00DD00392800's name is "bonzo"
```

IDENTIFY displays the above message if it finds the specified NIU. If it cannot connect with the NIU, it displays:

```
>>Identify 14632Enter
Checking ... Done
We get no response from Node ID 00DD00392800.
```

INTERCONNECT

(EXTENDED Command)

SYNTAX

INTERCONNECT <resource_name_1> <resource_name_2>

<resource_name_1> and <resource_name_2> represent the names of devices or services that you wish to interconnect. Net/One displays the word "and" when you type the carriage return following <resource_name_1>.

DESCRIPTION

INTERCONNECT is intended to be used for establishing a virtual circuit between two resources that cannot establish it themselves. Do not use it to connect your PC to a device or service. You must specify both end points of the virtual circuit.

INTERCONNECT is an extended command. It is available on your PC only if the network manager has configured it on your PC. Issue a **LIST** command to see if it appears.

When either or both resources are preceded by an asterisk(*), all local networks in an internetwork system are searched for the named resource. This search includes the local network to which the initiating resource is attached.

Do not confuse **INTERCONNECT** with **CONNECT**, which is used to create a virtual circuit between the device issuing the **CONNECT** and a specified resource. To break a connection established with **INTERCONNECT**, use the **DISCONNECT** command.

EXAMPLE

To interconnect a printer with the network identity "print5" and a host port with the network identity "host2", use the following command line:

```
>>interconnect print5  and host2   
Interconnecting ... Success.  
"print5" [(1) 6a4] and "host2" [(1) 1684a2] are interconnected.
```

LIST

(STANDARD Command)

SYNTAX

LIST Enter

DESCRIPTION

LIST displays the current values for the cancel last character, cancel last word, cancel whole line, and complete current word, as well as the echo and line feed status, the Disconnect and Hold sequences, the network address, device name and alternative IDs.

In order to break a connection to the PC that you are using, you must know it's Disconnect sequence. When you are using a PC or terminal other than your own, it is wise to list the Disconnect sequence before making any connections.

The Disconnect and Hold sequences may be represented in ASCII quite differently from the way you type them. If you have any questions about any of the ASCII representations displayed by the **LIST** command, consult your network manager.

The **LIST** command has several options. Type **LIST** followed by a question mark (?) and carriage return to see them.

>>list ?

The LIST commands are:

LIST CONNECTIONS<CR>

LIST DISCONNECT<CR>

LIST HOLD<CR>

LIST ECHO MODE<CR>

LIST LINEFEED MODE<CR>

LIST MODES<CR>

LIST NAMES<CR>

LIST EDITING KEYS

LIST [ALL] MESSAGES<CR>

LIST TIME<CR>

Typing **LIST** without an option gets you a full display. Each option displays a portion of the full **LIST** display. To select an option, type **LIST** followed by the option name. For example, to see if local echo is on or off use the following command line.

>>list echo mode

ECHO mode is turned OFF.

EXAMPLE

To display the operating characteristics currently defined for your PC, use the following command line (we show a sample response; yours may differ).

>>list **Enter**

You are using port 1 of Net/One PC-NIU number 19023A, on network number 4.
Port 1's name is "19023A1". PC-NIU 19023A's name is "R.smurffle.

Connection 1 is unused.

Connection 2 is unused.

Connection 3 is unused.

Your Hold Sequence is: <ESC>OQ

Your Disconnect Sequence is: <ESC>OP

The Net/One command editing keys are:

Cancel whole line: or ^<BS> Delete last character: <BS> or ^h

Delete last word: <CAN> or ^x Complete current word: <SP>

Repeat last line: <SOH> or ^a

ECHO mode is turned OFF.

Automatic insertion of linefeeds after carriage returns is turned OFF.

>>

QUIT

(STANDARD Command)

SYNTAX

QUIT

DESCRIPTION

QUIT exits the command interface and disconnects all circuits on hold (including those initiated by the **GET** command). This frees the PC to accept incoming connection requests. The **QUIT** command is not the opposite of a **CONNECT** command, and it does not log off a particular system.

A **QUIT** command causes all parameters that were temporarily changed with the **SET** commands to revert to the permanent values assigned by the network manager.

EXAMPLE

To put a PC into Idle mode, use the following command line:

>>**quit**
Idle

RESUME

(STANDARD Command)

SYNTAX

RESUME <connection_number> **[Enter]**

<connection_number> is the number associated with the virtual circuit you want to reactivate.

DESCRIPTION

Use **RESUME** to reactivate a specified connection previously placed on hold. Use it also to activate a connection requested with the **GET** command. The resumed connection becomes the current active connection.

Net/One may not be able to resume a connection for several reasons.

- There is currently no connection associated with that number.
- The connection given that number was terminated because you had not used it for longer than the timeout limit defined for your PC or for the network resource at the other end.
- A connection that you requested with a **GET** command has not been established yet.

Net/One assigns a sequential number to a connection at the time it is established. The first connection you establish is connection 1, the second is connection 2, and the third is connection 3. The maximum number of virtual circuits for each device is three. If you issue an **ABANDON** command to break connection 2, then issue a **LIST** command, you will see connections 1 and 3. To avoid confusion, Net/One does not move connections up to fill numerical gaps. The next one you establish will become connection 2.

EXAMPLE

Use the following command line to reactivate the suspended connection assigned the number 1.

```
>>resume 1 
```

Connection 1 has been resumed.

SET BINARY ON SET BINARY OFF

(STANDARD Command)

SYNTAX

SET BINARY ON

SET BINARY OFF

DESCRIPTION

When a device is in binary mode, all characters and data are transferred through the network with no processing by the NIU. Set binary mode to ON if you want the device port in binary transfer mode.

Any Hold or Disconnect Sequence you choose for this device is ignored while in binary transfer mode. Use the "break" key () to place the circuit on hold. Then you can use the **SET BINARY** command to take the device out of binary mode, **RESUME** the connection, and issue the hold or disconnect sequences.

SET DISCONNECT SET HOLD

(STANDARD Command)

SYNTAX

SET DISCONNECT /<new_disconnect_sequence>/Enter
SET HOLD /<new_hold_sequence>/Enter

<new_disconnect_sequence> and <new_hold_sequence> represent strings of one to four characters. The right slash character ("/") marks the beginning and end of the string.

DESCRIPTION




These two **SET** commands temporarily change the disconnect and hold sequences of your PC. The disconnect sequence breaks a virtual circuit between your PC and another network resource. The hold sequence suspends a virtual circuit.

Entering the Hold and Disconnect Sequences

Disconnect and hold sequences can be up to four characters in length, and can be made up of both printing and non-printing ASCII characters. Printing ASCII characters are any of the alphabetic, numeric, or special characters on the keyboard. Non-printing ASCII characters ordinarily have no displayed representation, such as an escape or a carriage return.

After you type the first right slash ("/") following **SET HOLD** or **SET DISCONNECT**, the command interpreter enters a "recording" mode: it remembers the next 1 through 4 keys you type, except for the "/", as the hold or disconnect sequence. Typing another "/" ends recording mode.

Non-printing ASCII characters (control characters) are accepted by **SET**. When it echoes them to the screen it usually represents them by their common ASCII functions. For example:

	is represented on screen by <ESC>"
	is represented on screen by <BS>
	is represented on screen by <CR>

If you need to use special nonprinting keys and you don't know what combination of keys to press on your keyboard, consult your network administrator.

For obvious reasons, the disconnect sequence and the hold sequence should be different. Furthermore, the first character of a sequence cannot be repeated in either sequence, except as the first character. The following examples illustrate this restriction:

- A disconnect sequence of "abad" is illegal because the letter "a" is repeated in the sequence.
- A disconnect sequence of "abc" and a hold sequence of "daf" is illegal because the "a" in the hold sequence is not the first character.

You may not use the command-editing characters between the slashes while you are typing the hold and disconnect sequences, because **SET** is recording every keystroke; it would simply record the editing keys as if you intended them to be in the sequence. If you make an error, type the second slash to turn off recording mode. Then you may use the cancel last word or cancel whole line character. Do not use cancel last character.

Using the Disconnect Sequence

When you type the disconnect sequence to break a connection, the characters do not appear on the screen. It is not necessary to type a carriage return unless it is part of the sequence. As soon as you type the last character, the following message appears.

You may now enter Net/One commands.
>>

Using the Hold Sequence

When you type the hold sequence to suspend a connection, the characters do not appear on the screen. It is not necessary to type a carriage return unless it is part of the sequence. As soon as you type the last character, the following message appears.

Connection 1 to "host2" [(1) 492c6] is on hold.
You may now enter Net/One commands.
>>

EXAMPLE

To set the disconnect sequence to the string "+***", use the following command line:

```
>>set disconnect /+***/ 
```

Your new disconnect Sequence is "+***".

To set the hold sequence to the string "#~~~" use the following command line:

```
>>set hold /#~~~/ 
```

Your new hold Sequence is "#~~~".

Control and Non-printing Characters

If your hold or disconnect sequence includes control characters (or other non-printing characters) SET will represent each one on the screen in terms of its ASCII function. precede each one with the caret ("^") symbol. For example:

```
>>set disconnect /<ESC>!<DC4>/ 
```

is equivalent to the sequence:

SET ECHO ON SET ECHO OFF

(STANDARD Command)

SYNTAX

SET ECHO ON
SET ECHO OFF

DESCRIPTION

Local echoing displays each character that you send to Net/One at your PC so that you can verify that what you type is correct. Use the **LIST** command to check whether echo is ON or OFF.

Usually, your PC will be connected to a host or service that echoes the characters that you send it. When you are connected to such a host, echo should be set to OFF. If echo is set to ON when you are connected to such a host, Net/One echoes each character and so does the host, and you will see two of each character you type.

On some occasions, you may connect your PC to a device that does not echo characters. Before you connect to such a device, set echo to ON so that you can see the characters that you are sending to the device.

SET FLOW

(STANDARD Command)

SYNTAX

SET FLOW {NONE}
 {CHARS} FOR {NIU}
 {ENQ-ACK} {DEVICE}
 {XON-XOFF}

SET FLOW lets you change the method of flow control used between your NIU and another device. It offers four methods of flow control, as described below.

- {NIU}** refers to the flow control method recognized by your workstation application or terminal emulator when receiving.
- {device}** refers to the flow control method to be used by the device at the other end of a connection when receiving.

DESCRIPTION

The Net/One software offers data *flow control* to stop and start the flow of data between your workstation and another device.

In flow control, a computer or other device receiving characters from a remote device transmits special characters back to the sending device when it wants that device to stop sending. For example, at a PC, if you wish to stop receiving characters in order to read what has already come in, you might hit the keys to request the sending host to suspend its transmission; and then to resume receiving (this method is called "X-ON/X-OFF" flow control). Other methods are available; the important thing is that the sender and receiver must both use the same method. Consult your network administrator to find out what method you should use in a given situation.

Data flows both to and from a device. When you specify what type of flow control a device uses, you can choose the same method for both from and to the device, or you can choose a different method for each direction. That is the meaning of the choice "NIU" or "DEVICE" with the **SET FLOW** command.

"**SET FLOW** <method> **NIU**" sets the method for receiving at your workstation; "**SET FLOW** <method> **DEVICE**" sets the method the remote device will use when receiving.

SET FLOW NONE turns off flow control.

SET FLOW CHARS causes flow control to be handled by the characters that were specified when the NCC was configured. If no characters were specified, <DC1> is used for XON and <DC3> is used for XOFF.

SET FLOW XON-XOFF selects flow control handled by the X-ON/X-OFF flow control method. This is the method used, for example, by DOS to give you control over screen output: you type **Ctrl S** to stop output, and **Ctrl Q** to resume.

SET FLOW ENQ-ACK selects flow control handled by the ENQ-ACK method. This method is extensively used by Hewlett-Packard computers and terminals.

NOTE

The generic Net/One command interface offers several other types of flow control, not described here. If your **HELP/?** display lists other types of flow control available, do not use them; they are not appropriate for personal computer workstation use.

EXAMPLE

To select the X-ON/X-OFF flow control option used for receiving data at your workstation, type:

SET FLOW XON-XOFF FOR NIU

To reset (turn off) flow control for a remote device, type:

SET FLOW NONE FOR DEVICE

SET LINEFEEDS ON SET LINEFEEDS OFF

(STANDARD Command)

SYNTAX

SET LINEFEEDS ON

SET LINEFEEDS OFF

DESCRIPTION

This command turns on or off the automatic insertion of linefeed characters after carriage return characters that are sent to your PC. When your PC is connected to a device or service that sends a linefeed character after each carriage return, turn linefeeds off. When the device or service sends only carriage return, turn linefeeds on.

APPENDIX A

USING GRAPHICS APPLICATIONS

The Connection Manager can be invoked at any time, even in the middle of personal computer applications. When the Connection Manager is activated it copies all of the data currently on the screen into the PC's memory. When you exit the Connection Manager, the previous screen data is restored.

The IBM PC, XT and XT video adapter architecture includes support for both text-only (character oriented) and graphics applications, although the IBM monochrome adapter will only support the former. Most other adapter cards available will enable you to run graphics applications, such as Microsoft Windows or Borland's Reflex.

When the Connection Manager is brought up with a character oriented application, you will not notice anything unique about the display, except that the Connection Manager pop-up windows will overlay any data the application may have on the screen. When you exit the Connection Manager, that data will be restored to its original state.

When running graphics applications, however, one of two things will occur depending upon the type of monitor that you have. One possibility is that the graphics application will become completely garbled while the Connection Manager window is perfectly legible. Do not be alarmed by this situation. In order for the Connection Manager to work, it has to turn the video adapter from graphics mode into character mode. This causes the graphics data displayed on the screen to appear garbled. When you exit the application, the graphics data will be restored to its original state. This is how the IBM color graphics and Hercules color graphics adapters will function.

A second possibility is that the full graphic screen will be erased from the screen and the Connection Manager pop-up window will come up as a character oriented screen. This character oriented screen will generally look just the way your screen appeared right before you entered the graphics application. When you exit the Connection Manager, all the graphics information will be redisplayed on your screen. This is true with the Hercules monochrome/graphics adapters.

APPENDIX B

REDIRECTING DEVICES TO THE NETWORK

Chapter 3 described the Connection Manager 2's ability to redirect DOS devices to the network. This section discusses briefly how this is accomplished.

When you redirect a DOS device for output to the network, the Connection Manager 2 sets itself up to intercept this output at the ROM BIOS level. This includes the BIOS interrupt 14h for COM output and BIOS interrupt 17h for LPT output. Any application that writes to these interrupts can be routed out to the network.

As data is sent out to the DOS device that is redirected, the Connection Manager 2 intercepts it and sends it out to the network. This is sent out through the Net/One NETCI interrupt 6Bh, which is the most common interface for Net/One terminal emulators. See the *Personal Connection Programmer's Reference* for more information.

APPENDIX C

TERMINAL EMULATION

The Connection Manager 2 implements a subset of the VT-100 and VT-52 control sequences for screen management. The VT-100 functions are based on the capabilities of *ANSI.SYS*, which must be installed as a device in *CONFIG.SYS* to enable these functions. The *ANSI.SYS* functions that are not implemented are cursor position report, device status report, set graphics rendition, set mode, reset mode, and keyboard key reassignment. The latter means that no keyboard remapping has been implemented.

Table C-1
Supported VT-52/VT-100 Control Sequences

Function	VT-100	VT-52
Cursor Up	ESC [#A (1)	ESC A
Cursor Down	ESC [#B (1)	ESC B
Cursor Right	ESC [#C (1)	ESC C
Cursor Left	ESC [#D (1)	ESC D
Cursor to Home	ESC [H	ESC H
Reverse Line Feed		ESC I
Clear Screen	ESC [2J	CTRL L
Erase End of Screen	ESC [J	ESC J
Erase End of Line	ESC [K	ESC K
Direct Cursor Positioning	ESC [l;cH (2)	ESC Ylc (3)
Horiz. & Vert. Positioning	ESC [l;cf (2)	
Save Cursor Position	ESC [s	
Restore Cursor Position	ESC [u	

(notes on next page)

Notes

- (1) The value of **#** determines the number of cursor positions moved.
- (2) **l** specifies the line number and the **c** specifies the column number of the desired cursor position.
- (3) **l** specifies the line number and the **c** specifies the column number of the desired cursor position. Line and column numbers for direct cursor positioning are single character codes whose values are the desired number plus 31. For example, line 2 and column 4 would be **ESC Y!#**.

APPENDIX D

(There is no Appendix D in this manual; it is reserved for future use in the *Connection Manager 2 User's Guide*).

APPENDIX E

SYSTEM MESSAGES

OVERVIEW

In this appendix, you will find details about error and information messages that appear on your screen as you use Net/One commands. The messages are organized by the command which may generate them.

Most Net/One messages are simple and self explanatory. However, if you are a new user, you may have questions you will want answered in detail. In addition, you may need trouble-shooting clues, which some of these messages can provide.

ABANDON Messages

You have to specify a Connection Number to the Abandon command.

Cause: You entered the **ABANDON** command without specifying a connection number.

Action: Reenter the command, followed by a space and a connection number. If you do not know the connection number, issue a **LIST** or **LIST CONNECTIONS** command to see what connections you have established.

<X> is not a valid Connection Number.

Cause: You typed the **ABANDON** command with a character other than 1, 2, or 3.

Action: Use **LIST** to check the connection number you want. Then reenter the **ABANDON** command with the correct connection number.

CONNECT Messages

Connecting ... <named resource> was not found.

Causes: Either the named resource is off the network, or you incorrectly typed its name. The resource may be off the network because it has not been configured or enabled, or because it is configured to be offline.

Action: Find the correct resource name and type it in again. Remember to use an asterisk (*) if the resource is on a neighboring network in an internet.

If reentering the command does not work, use **EXAMINE** to see whether the resource is accessible. If the resource has not been configured to be on the network, use the Configure program; then reset its NIU.

Connecting ... <named resource> is busy.

Cause: You issued a **CONNECT** command with a unique resource name, and that resource port is busy.

Action: Issue a **GET** command. **GET** will repeatedly try to connect the resource until successful.

Connecting ... all <named resource> ports are busy.

Cause: You issued a **CONNECT** command with a rotated resource name, and all ports on corresponding resources are busy.

Action: Issue a **GET** command. **GET** will repeatedly try to connect the resource until successful.

Connecting ... Cannot connect to <named resource>

Causes: First your NIU checks for a free port on the named resource; then it requests the connection. However, the resource port may be busy by the time your NIU requests a connection to it. In that case, you would see the above message.

Action: Try issuing the **CONNECT** command again.

You cannot make another connection until you **ABANDON** one you have now.

Causes: You have used all the virtual circuits allotted to your terminal.

Action: Use the **ABANDON** command to break a circuit; then issue the **CONNECT** command again.

You cannot make another connection until you **ABANDON** the one to "<resource name>".

Causes: You used the **GET** or **CONNECT** command to request a connection to the named resource. However, your terminal can only have one connection, and that connection is already in use.

Action: If you do not need the connection you already have, use the **ABANDON** command to break it; then issue **CONNECT** or **GET** again.

DISCONNECT Messages

Disconnecting ... Failure.

The Disconnect failed because "<named resource>" is not a unique Resource Name.

Cause: You specified a rotated name for the resource you want to disconnect.

Action: You must use the unique name of the resource you want to disconnect.

Disconnecting ... Failure.

The Disconnect failed because "<named resource>" could not be found.

Causes: Either you incorrectly typed the resource name, or the named resource is off the network.

The resource may be off the network because it has not been configured or enabled, or because it is configured to be offline.

Action: Find the correct resource name and type it in again. Remember to use an asterisk (*) if the resource is on a neighboring network in an internet.

If reentering the command does not work, use the **EXAMINE** command to see whether the resource is accessible. If the resource has not been configured to be on the network, use the Configure program; then reset its NIU.

Disconnecting ... Failure.

<named resource>" will not respond to our inquiry.

Cause: The named resource was found but cannot respond. A problem may exist in the resource's hardware or software.

Action: Try the **DISCONNECT** again.

Disconnecting ... Failure.

<named resource> could not be disconnected.

Cause: The named resource will not respond to the **DISCONNECT** command. This is probably a temporary situation.

Action: Try the **DISCONNECT** again.

EXAMINE Messages

Some of the messages that **EXAMINE** displays are explained below. In these explanations, the expression **<named resource>** represents the resource that you want to examine, and **<network resource>** represents the resource to which **<named resource>** is connected.

The "Success" messages described in this Appendix are information messages, which do not require action on your part. Two "Failure" messages are also described with recommended actions.

Each of these messages will be followed by a list of all other names for the named resource, and for the connected resource, if one is mentioned in the message.

Examining ... Success.
<named resource> is offline.

Explanation: The Configure program was used to specify that this resource's port is "offline." To redefine the port as "online", use the Configure program on your network console.

Examining ... Success.
<named resource> is unavailable.

Explanation: The resource is temporarily unavailable. It is in transition between Idle mode and Command mode.

Examining ... Success.
<named resource>" is in command mode.

Explanation: The named resource is displaying the user interface (Command Interpreter).

Examining ... Success.
<named resource>" is establishing a connection.

Explanation: The named resource is in the process of establishing a connection with another network resource.

Examining ... Success.
<named resource> is trying to set up a permanent circuit.

Explanation: The named resource's NIU is initiating a permanent circuit. A permanent circuit is a type of virtual circuit that an NIU tries to create every time the NIU is reset or the circuit broken.

Examining ... Success.
<named resource> is trying to set up an initial circuit.

Explanation: The named resource's NIU is initiating an initial circuit. An initial circuit is a type of virtual circuit that the NIU tries to create each time it is reset.

Examining ... Success.

<named resource> is trying to set up a demanded circuit.

Explanation: The named resource's NIU is initiating a "demanded circuit." A demanded circuit is a virtual circuit that the NIU creates when the terminal user types a predefined demanded-circuit initiation character.

Examining ... Success.

<named resource>" is connected to <network resource>.

Explanation: The named resource has been connected to the network resource with an **INTERCONNECT** command.

Examining ... Success.

<named resource>" is connected by a command to <network resource>.

Explanation: The named resource was connected to the network resource with either a **CONNECT** or a **GET** command.

Examining ... Success.

<named resource> is connected by a permanent circuit to <network resource>.

Explanation: The named resource's NIU has established a permanent circuit to the network resource. A permanent circuit is a type of virtual circuit that an NIU tries to create every time the NIU is reset or the circuit broken.

Examining ... Success.

<named resource> is connected by an initial circuit to <network resource>.

Explanation: The named resource's NIU has established an "initial circuit" to the network resource. An initial circuit is a type of virtual circuit that the NIU tries to create each time it is reset.

Examining ... Success.

<named resource> is connected by a demanded circuit to <network resource>.

Explanation: The named resource's NIU has established a "demanded circuit" to the network resource. A demanded circuit is a virtual circuit that the NIU creates when the terminal user types a predefined demanded-circuit initiation character.

Examining ... Success.

<named resource> won't report its status.

Explanation: EXAMINE found the named resource, but the resource cannot respond. A problem may exist in the resource's hardware or software. This condition may be temporary. Try EXAMINE again.

Examining ... Success.

<named resource> is disabled.

Explanation: The named resource was disabled either because of too many unsuccessful login attempts or because someone disabled it from the network console. Use the Reset NIU program on the NCC to re-enable the resource.

Examining ... Failure.

The **Examine** failed because <named resource> could not be found.

Causes: Either the named resource is off the network or you incorrectly typed its name.

Action: Find the correct resource name and use it to reissue the **EXAMINE** command.

Examining ... Failure.

<named resource>" will not respond to our inquiry.

Causes: The named resource was found but cannot respond. A problem may exist in the resource's hardware or software.

Action: Try the **EXAMINE** command again.

GET Messages

You may or may not see messages in response to the **GET** command when you are actively connected to another resource.

To see most Net/One messages, you first have to disconnect the resource or put it on hold, thus returning to the user interface. However, you can configure your system to allow **GET** messages to interrupt an active connection.

You cannot make another connection until you **ABANDON** one you have now.

Causes: You have used all the virtual circuits allotted to your terminal.

Action: Use **ABANDON** to break a circuit; then issue **GET** again.

You cannot make another connection until you **ABANDON** the one to <resource name>.

Causes: You used **GET** or **CONNECT** to request a connection to the named resource. However, your terminal can only have one connection, and that connection is already in use.

Action: If you do not need the connection you already have, use **ABANDON** to break it; then issue the **CONNECT** or **GET** command again.

Your connection to "<resource name>" is ready to use as connection <X>.

Causes: The **GET** command has established a connection to a requested network resource. The X represents the connection number, which will be a number from 1 to 3.

Action: To use the connection that **GET** established, issue a **RESUME** command specifying the connection number that appears in this message.

INTERCONNECT Messages

When the **INTERCONNECT** command is successful, Net/One displays a message that tells you the two resources are connected. When the command is not successful, Net/One displays one of the failure messages explained below.

Interconnecting ... Failure.

The Interconnect failed because "<named resource>" was not found.

Causes: Either the named resource is off the network or you incorrectly typed its name.

Action: Find the correct resource name and use it to reissue the **INTERCONNECT** command. If you get this message again, use the **EXAMINE** command to see whether the resource is available.

Interconnecting ... Failure.

The Interconnect failed because "<named resource>" is busy.

Causes: You issued an INTERCONNECT command with a unique resource name, and that resource port is busy.

Action: If the desired connection is needed more than the busy resource's present connection, disconnect the resource and reissue the INTERCONNECT command.

Interconnecting ... Failure.

The Interconnect failed because all "<named resource>" ports are busy.

Causes: You issued an INTERCONNECT command with a rotated resource name, and all ports on corresponding resources are busy.

Action: If the desired connection is needed, and one of the busy resources' other connections is less needed, disconnect the least-needed port and reissue the INTERCONNECT command.

Interconnecting ... Failure.

"<named resource>" and "<named resource>" could not be interconnected.

Causes: One of the resources became busy after you issued the INTERCONNECT command but before the command could establish the connection.

Action: Try the interconnect again. If it still does not work, you can disconnect the least-needed connection and reissue the INTERCONNECT command.

LIST [CONNECTIONS] Messages

When you type the **LIST** command, with or without the **CONNECTIONS** parameter, you see one of the messages shown below.

Most of these are information messages, which do not require action on your part. **<X>** represents the connection number, from 1 to 3.

Connection **<X>** is being accepted.

Explanation: Someone on the network has issued a **CONNECT** command from their terminal to yours. Your terminal is in the process of accepting the connection.

Connection **<X>** is unused.

Explanation: This connection is available for use.

Connection **<X>** is not open yet.

Explanation: The **GET** command is still trying to establish a connection to a requested network resource. Either you incorrectly typed the resource name, or all ports on the resource are still busy.

Connection **<X>** is ready to use.

Explanation: The **GET** command has established the connection you requested.

Connection <X> is on hold.

Explanation: You used your Hold Sequence to put this connection on hold. If you want it to be the active connection, use the **RESUME** command.

Connection <X> is being closed.

Explanation: The connected resource is in the process of closing this connection.

Connection <X> was closed by Idle Circuit Timeout.

Explanation: You did not use this connection within the time length specified for an Idle Circuit Timeout.

Idle Circuit Timeout is a feature designed to save computer-processing and port-connection time. After a port on the NIU has not been used for the specified length of time, the NIU will close the connection. You can use the Configure program to specify the Idle Circuit Timeout value for an NIU.

Connection <X> was closed by administrative action.

Explanation: The network manager used the **DISCONNECT** command to break the circuit between your terminal and another network resource.

Connection <X> was closed by a Network Timeout

Causes: A Network Timeout is caused by a variety of hardware and software problems: the NIU equipment is malfunctioning; the remote NIU is not plugged in, or its software has malfunctioned; a transceiver cable is loose; a transceiver is dead.

Action: Check the STATUS and TRANS lights on the remote resource's NIU.

For information on how to read these lights, refer to the installation and operation guide for that model NIU. If you cannot clear up the problem after checking the probable causes, contact your Ungermann-Bass representative.

RESUME Messages

The **RESUME** command reactivates a specified connection previously on hold. **RESUME** also activates circuits that have been established and put on hold by the **GET** command. In either case, the resumed connection becomes the active connection.

Some of the messages that **RESUME** displays are explained below.

Connection <X> has been resumed.

Causes: Net/One displays this message when the **RESUME** command successfully activates a circuit that has been on hold.

Action: When you are resuming a connection to a host and you see this message, press **[Enter]** to get the system prompt. You have to specify a Connection Number to the **RESUME** command.

You have to specify a Connection Number to the RESUME command.

Causes: You entered the **RESUME** command without specifying a connection number.

Action: Reenter the command, followed by a space and a connection number.

If you do not know the connection number, issue a **LIST** or **LIST CONNECTIONS** command to see what connections you have established.

<X> is not a valid Connection Number.

Causes: You typed the **RESUME** command with a connection number other than 1, 2, or 3.

Action: Use **LIST** to check the connection number you want. Then reenter the **RESUME** command with the correct connection number.

Connection <X> cannot be resumed.

Causes: **RESUME** is not able to resume a connection for one of several reasons:

- There is currently no connection associated with the specified connection number.
- The specified connection was broken because you did not use it during the timeout limit defined for your terminal or the connected network resource.
- A circuit you requested with a **GET** command has not been established yet.

Action: If you have not yet requested the connection you want or if it has been broken, use **GET** to create it. If you have already requested the connection, but it is not yet established, use **EXAMINE** to see if the desired resource is busy.

Other Net/One Messages

This port is being disabled because of too many unsuccessful login attempts.

Causes: You have incorrectly typed your log-in information too many times, and your port is now disabled.

Action: To reenable a port that has been disabled, use the Enable/Disable Port utility from the NCC main menu.

This port has been disabled for security reasons.

Causes: You tried to use a resource that has been disabled by the Validation Server. The resource was automatically disabled after a user entered incorrect log-in information too many times.

Action: First reenable the resource through the Validation Server. Then use the network console to reenable the port.

An incoming call from <resource name> has been accepted as connection <X>.

Causes: Someone issued a **CONNECT** command specifying your terminal.

Action: Use **RESUME** to activate the connection or **ABANDON** to break it.

Your Connection number <X> to/from "<resource name>" has been closed by administrative action.

Causes: Someone used **DISCONNECT** to break the circuit between your terminal and another network resource.

Action: Find out the reason for the broken connection. If you still need the network resource, use **CONNECT** to establish a new connection.

Your Connection number <X> to/from <resource name> has been closed due to Network Timeout.

Causes: A Network Timeout is caused by a variety of Network Timeout error message hardware and software problems: the NIU equipment is malfunctioning; the remote NIU is not plugged in or its software has malfunctioned; a transceiver cable is loose; a transceiver is dead.

Action: Check the STATUS and TRANS lights on the remote resource's NIU. For information on how to read these lights, refer to the installation and operation guide for that model NIU. If you cannot clear up the problem after checking the probable causes, contact your Ungermann-Bass representative.

Your Connection number <X> to/from <resource name> has been hung up.

Causes: The specified connection was closed by a resource other than your terminal: for example, the user of the connected resource issued an **ABANDON** command or the resource was inactive long enough to be disconnected by an Idle Circuit Timeout. When you log out, you receive this message from your local NIU telling you that the connected resource ended the specified connection.

Action: This is an information message. No action is required.

Your Connection number <X> to/from <resource name> has been closed by Idle Circuit Timeout.

Causes: You did not use this connection within the time length specified for an Idle Circuit Timeout. Idle Circuit Timeout is a feature designed to save Idle Circuit Timeout error message. Idle Circuit Timeout defined computer-processing and port-connection time. After a port on the NIU has not been used for the specified length of time, the NIU will close the connection. You can use the Configure program to specify the Idle Circuit Timeout value for an NIU.

Action: If you still need the resource, use **CONNECT** to establish a new connection.

Sorry – I can't log you in now because no Login Verification Service is available."

Causes: The Login Verification Service (Validation Server) is not available. Either the Validation Server is not running, or the Network Control Console (NCC) is not running.

Action: Make sure the Validation Server and the NCC are running; then log in to Net/One.

Sorry – I can't log you in now because the Login Verification Service is not responding.

Causes: The Login Verification Service (Validation Server) has just become unavailable. This may occur because too many users are trying to log in at the same time.

Action: Type your login again.

You are being logged out because of too many incorrect password attempts.

Causes: You typed too many incorrect passwords, and the Validation Server logged you out of Net/One.

Action: Check to make sure that you are typing your password correctly. If you have forgotten your password, you will have to be revalidated on the system.

The Access Verification Service won't let you <command> <named resource>

Causes: You are not authorized to access the resource you specified when you issued a **CONNECT, INTERCONNECT, DISCONNECT, or EXAMINE** command. You may have typed the resource name incorrectly.

Action: Try the command again to make sure you typed the resource name correctly. Check the Validation Server data base to assure that you have authorization to access the resource.

Sorry - I can't <do something> because no Access Verification Service is available.

In this message, <do something> would be one of these phrases:

- connect you now
- interconnect you now
- disconnect you now
- examine you now

Causes: The Access Verification Service (Validation Server) is not available. Either the Validation Server is not running, or the Network Control Console (NCC) is not running.

Action: Make sure the Validation Server and the NCC are running before issuing a Net/One command that you need authorization to use.

Sorry -- I can't <do something> because the Access Verification Service is not responding.

In this message, <do something> would be one of these phrases:

- connect you now
- Interconnect you now
- disconnect you now
- examine you now

Causes: The Access Verification Service (Validation Server) has just become unavailable. This may occur because the Validation Server is receiving too many requests from users for the Command Interpreter at the same time.

APPENDIX F

DEVICE CHARACTERISTICS RECORD

DEVICE CHARACTERISTICS	
Device name:	
Alternative Identities	#1:
#2:	#3:
Network address:	Network ID:
KEYS:	
backspace:	word delete:
line delete:	word completion:
SEQUENCES:	
disconnect:	hold:
STATUS:	
echo:	line feed:
FREQUENTLY USED CONNECTIONS:	
name/address:	
name/address:	
name/address:	
name/address:	
name/address:	
name/address:	

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